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Railway & Commercial Gazette

Vol. CCXL No. 6133

LONDON, MARCH 6, 1953

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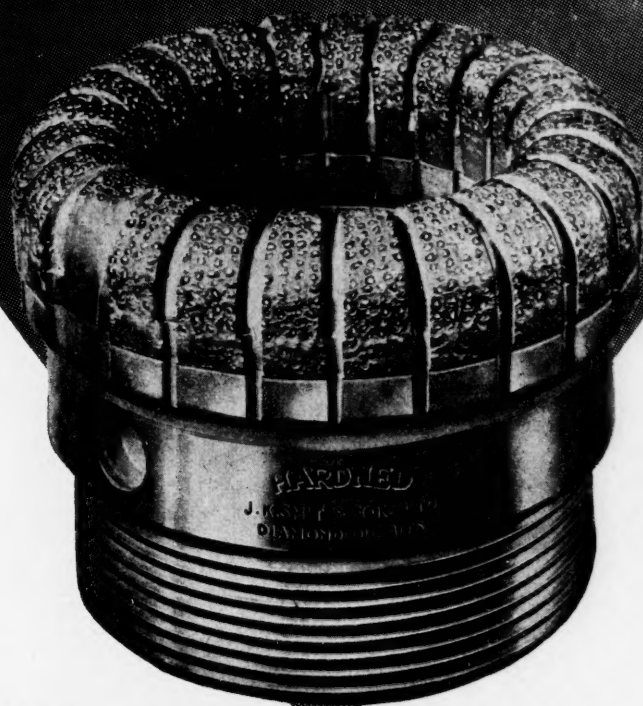
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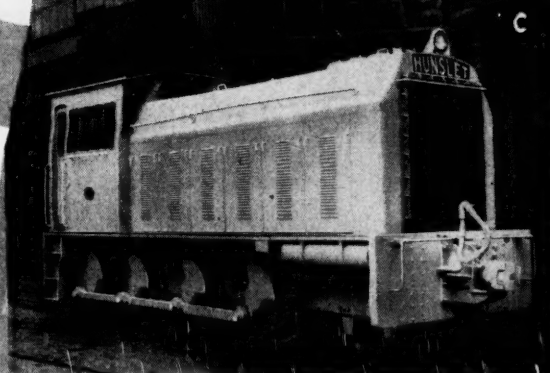
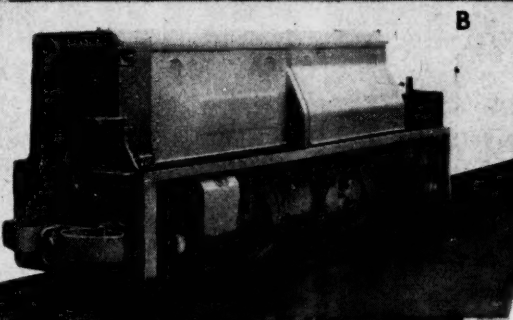
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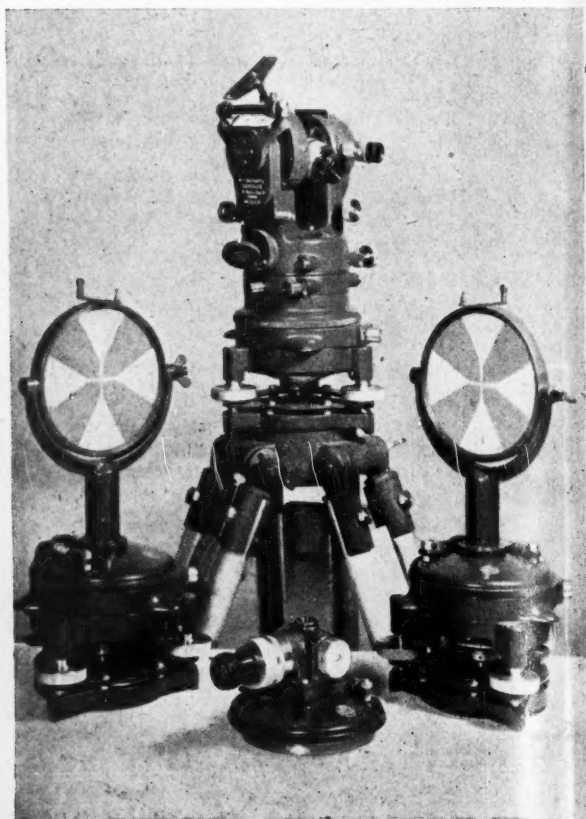
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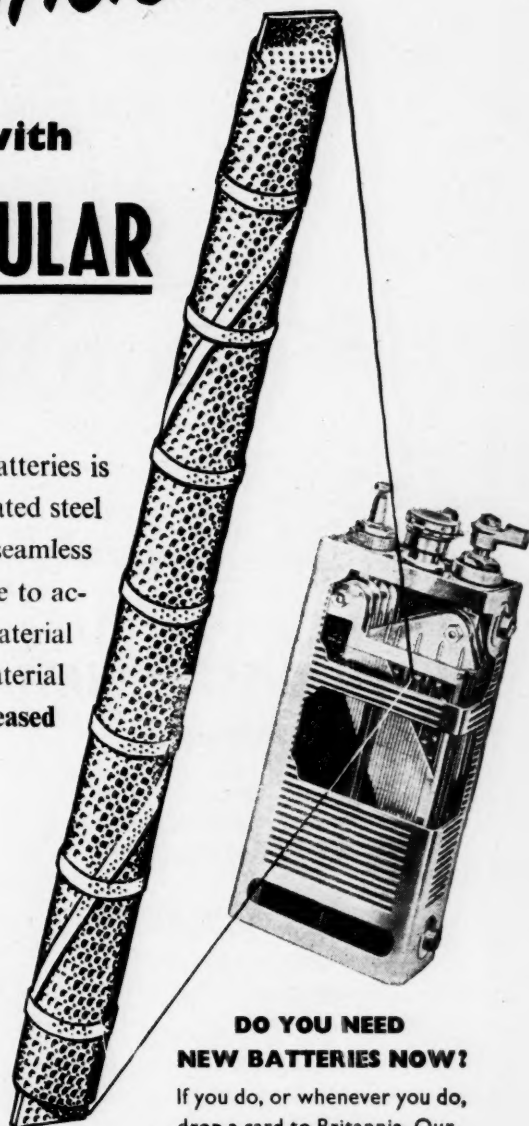
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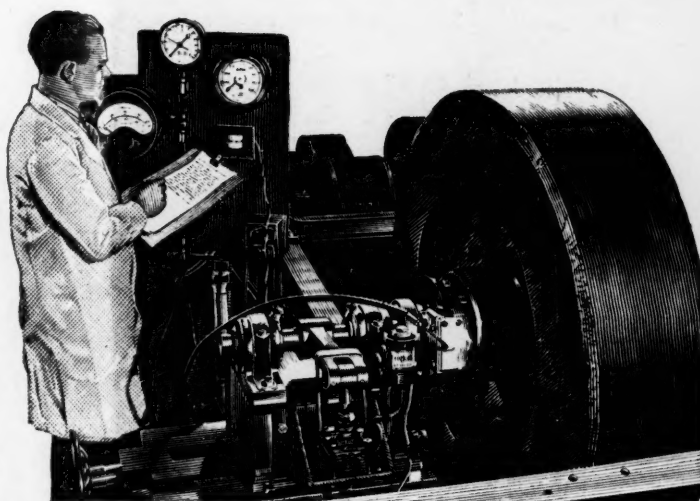
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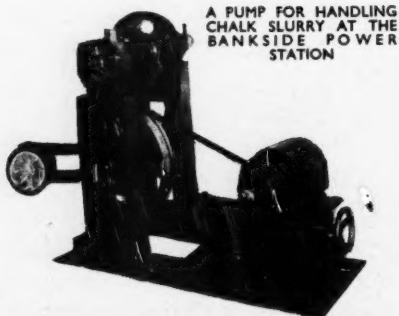
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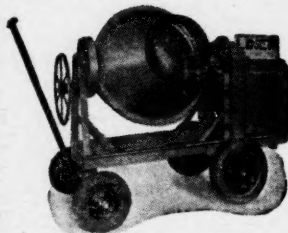
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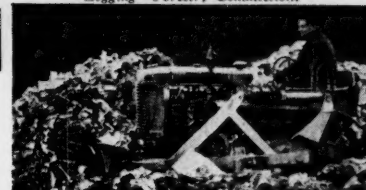
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The Mining Journal

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NOTES AND COMMENTS

1952 A Banner Year for Tanganyika

The Tanganyika Commissioner for Mines, Mr. V. T. Hockin, has achieved something of a record in giving us an official report on the progress of the Territory's mining industry for last year, only two months after the completion of the period. *Bis dat qui cito dat* is a maxim which is particularly applicable to prompt information regarding a progressive mining field. He notes that the year was one of steady progress in all branches of the industry. The most noteworthy features were the breaking of all previous records for value of mineral production and exports ; the proving of large reserves of good quality coal in the Southern Province ; the unabated interest in prospecting for base metals by influential overseas mining concerns ; the grant of an oil exploration licence to an important group ; and the reconciliation of differences between Williamson Diamonds Ltd. and the Diamond Corporation Ltd. which set in motion once again the full flow of diamond exports held back by a dispute since early in 1950.

The provisional value of all minerals exported was £6,268,770 as compared with £1,623,711. This immense increase is due to the fact that diamonds once more occupied a leading place with a total of 331,643 carats valued at £4,606,930. This total however includes the disposal in the course of the year of a back log of production accumulated by Williamson Diamonds during part of 1950 and the whole of 1951 and is thus a much inflated figure and Mr. Hockin suggests that the output for last year had a probable total value of £3,800,000 which is in itself a record. During the year the installation of a new large treatment plant at the Mwadui mine of Williamson Diamond was commenced. The plant will be capable of handling an additional 3,000 tons of gravel in 24 hours and includes what is understood to be the longest single drive belt conveyor in Africa—6,000 ft.—and is estimated to cost over £1,000,000. During the year diamond production at Mwadui as well as the neighbouring mine of Alamazi Ltd. was maintained.

Production of gold according to the preliminary figures was 130,851 crude oz., as compared with 129,439 oz. in 1951. The value however improved to £874,814 compared with £851,289. This gain was due to the fact that the mines were allowed to sell their entire output in the premium

market against payment in dollars. The total so sold amounted to 52,289 f.oz. and averaged £13 6s. 3d. per oz.

On the property of the Kaibakari Mines Ltd. the Colonial Development Corporation carried out a detailed geological examination and diamond core drilling programme, and eventually exercised their option to acquire the company's holdings.

Production of lead concentrates improved from 2,965 tons to 4,837 tons. This production was entirely from the pilot plant and as the result of an agreement between Uruwira Minerals Ltd. and the American Defence Materials Procurement Agency (which advanced \$1,640,000) the construction of a new treatment plant with a daily capacity of 1,000 tons of ore was commenced.

Among minor products the export of mica continued to expand ; sheet mica improved by 58 per cent to 109 tons with a value of £144,000 and 40½ tons of ground mica and a ton of waste were also shipped. Some waste was imported from Southern Rhodesia for conversion into splittings at the Morogoro mica factory of F. F. Chrestian and Co. Exports of tin concentrates declined to 62 tons compared with 92 tons in the previous year. This is due chiefly to the suspension of output at a number of properties held by the Colonial Development Corporation pending tests now in progress with a view to establishing systematic development and co-ordinated production. More particularly in the Murongo region of the Bukoba tinfield. Exports of tungsten concentrates also declined to 35.9 tons compared with 39.26 tons in the previous year.

Production of kaolin improved to 164½ tons as compared with just under 49 tons in the previous year and a new company was incorporated in the U.K., the Pugu China Clay Company Ltd., to take over from Consolidated Goldfields and the East African Mining and Development Co. their interests in extensive deposits near Pugu, 17 miles from Dar-es-Salaam. The company also applied for an extensive mining lease. There was a small initial export of gypsum amounting to 750 tons in the Lushoto district which was sailed to Uganda and Kenya for cement manufacture. On the other hand there were no shipments of graphite or magnesite.

Of minerals still the subject of prospecting but not in production coal is the most important. The investigation of

coal occurrences in the southern province by the Colonial Development Corporation was virtually completed by the end of the year. The Corporation carried out some 60,000 ft. of core drilling as well as surveying many sq. miles of bush country. It is estimated that in the Ngaka and Kite-waka fields some 216,000,000 tons of extractable coal of good quality exists, besides another 40,000,000 tons indicated. In all, a gross tonnage in excess of 400,000,000 tons is reported, but no development can be attempted until rail communications are available. At the end of the year a mineral oil exploration licence was granted to be held jointly by the D'Arcy Exploration Company and the Shell Overseas Exploration Company. This licence covers the whole of the coastal belt between the Kenya and the Portuguese East Africa borders, including adjacent islands and territorial waters. The commencement of geophysical prospecting on Mafia Island and the carrying out of an aerial and marine survey was shortly to be initiated.

Generally the search for base metals by important companies continues over wide areas: diamond drilling in the Kungwe region of Lake Tanganyika, underground and geophysical search in the Ufipa and Bukoba districts, and surface reconnaissance in central and southern provinces. "Never before in the history of the Tanganyika mineral industry" writes Mr. Hockin "has so much important activity been in progress over such wide areas at the same time. In spite of this wider areas have still to hear the ring of the prospectors pick."

The Closing of Older Welsh Tinplate Works

Further indications of the existence of a buyer's market in many directions noted in our last week's comments in the metal section, is afforded by the closing down at the beginning of this week of some 65 old type tinplate mills and the temporary displacement of some 5,000 operatives in South Wales. Stocks of tinplate at the mills have been accumulating for some time, and are currently estimated at about 1,000,000 base boxes. This accumulation appears primarily due to the coming into operation of the large strip mill at the Trostre Works of the Steel Company of Wales, though the projected new mill at Velindre, near Swansea, should not be forgotten; however this latter project is hardly likely to be operative for several years to come.

As a result the Ministry of Supply has greatly eased the quantities which may be purchased without prior authorization, the limit having been increased from one to eight tons a month. Moreover, the products of the Trostre Works are preferred by consumers to that of the old hand mills despite higher prices. It has been recognized that the advent of the modern mills was bound ultimately to supplant the old fashioned works but the rapidity with which this change would operate appears to have been underestimated. Their production is stated to have already risen by 33 per cent with an eventual capacity of some 50 per cent over the previous total output. What does not seem to have been realized is the almost inevitable reaction of consumers to the knowledge that they have no longer to fear a shortage of supply and need not therefore incur the heavy expense of carrying stocks to ensure continuity of their own operations. They now find themselves able to leave the tinplate makers to carry the burden of surplus stock. In other words, this is another instance of the natural working of supply and demand, which is to be expected in the working of a freer economy.

With the advent of the Trostre electrolytic tinplate manufacture, economy in the consumption of tin becomes more possible. In the United States electrolytic tinplate now represents something like 70 per cent of the total output compared with 64.7 per cent in 1951 when tin consumed in the manufacture of tinplate fell to 32,172 tons of tin as compared with 37,408 tons in 1950. It is hoped that the closing down of the older mills may be necessary only for

two or three months until the more active period of demand natural in the summer season begins, but with the eventual prospect that the Velindre strip mill may be in operation in two or three years time this expectation may have to be revised. Moreover, world production of tinplate last year was below the figure for 1951 though of course the American steel strike may be mainly accountable for the decline. Shipments of tinplate amounted to 4,183,039 tons (2,817,449 electrolytic; 1,365,590 hot dipped) compared with 4,515,691 tons (electrolytic 2,887,129; hot dipped 1,628,562) in 1951. British exports of tinplate last year improved to 300,756 tons or an average of 25,000 tons a month as compared with 239,655 in 1951, and the figure in January was about the same just over 25,000 tons.

Growing Financial Strength of Northern Rhodesia

Mr. Roy Welensky in a speech delivered last week to members of the Northern Rhodesian Legislative Council gave a brief outline of the country's present sources of income, several of which would show substantial increases in the current year. That the Council was the forum for such an address lends credence to the view that the speech was intended for the ears of Southern Rhodesians who on April 9 will decide in a referendum whether or not to accept federation with Northern Rhodesia and Nyasaland. A salient argument advanced for federation by Northern Rhodesians is that the present prosperity and future development of the northern territory will aid Southern Rhodesia's financial difficulties. In 1948 Northern Rhodesia's total revenue amounted to £6,318,000, while that of 1953 is estimated at £30,340,000.

The dominant role played by the mining industry in the territory's welfare was shown by the fact that the value of copper produced had risen from £20,700,000 in 1948 to £79,200,000 last year. The production of lead and zinc at Broken Hill was almost half the value of Southern Rhodesia's total mineral production. In addition, the new Bancroft copper mine would have a capital cost expansion programme of £1,100,000, the total costs of the Chibuluma copper mine were expected to be £4,000,000, and in 1953 the four major operating mines on the copperbelt intended to spend approximately £6,000,000.

The Mining Journal—A New Address

After 42 years at 15 George Street, the Mining Journal will over this week-end be moving its offices to new and larger premises at 15 Wilson Street, Moorgate, E.C.2. This address, as will be seen from the plan on page 280, is somewhat more centrally situated for the mining section of the City even if it is further removed from the City's traditional centre as represented by the Bank of England, the Mansion House and the Royal Exchange.

In recent years our gradually expanding staff has been imposing an increasing strain on our present floor space, and for some time it has been apparent that a move would have to be made once we could find suitable premises, combining convenient location with adequate space both now and for the future. These requirements will, we believe, be successfully met at 15 Wilson Street, even if some of our out-of-Town friends, accustomed to finding their way to the Mining Journal by the familiar landmark of the Mansion House may not find Wilson Street quite so readily at their first visit.

Once we have settled down at our new address we look forward to the Mining Journal's many friends dropping in to see it in its new surroundings. In particular, we wish to extend a cordial invitation to those of our overseas readers who may be in London during this Coronation summer. Those of them who experience any difficulty in finding a business *pied-à-terre* during the celebrations will be very welcome at 15 Wilson Street so far as desks, chairs and telephones will allow.

Western United States

(From Our Own Correspondent)

Portland, Oregon, February 23.

Bills have been introduced in both the House and the Senate to permit the sale of gold in the United States and its territories on the open market instead of requiring producers to sell to the Mint at the fixed price of \$35 per oz. Sponsors of the Bills hope that this will lead eventually to a revaluation of gold and a return to the gold standard. While the Republican Party platform advocated "a dollar on a fully convertible gold basis" it is felt that such matters are premature at this time. Suits against the Government for damages sustained through enforcement of Order L. 208 which shut down all gold mines in October, 1942, are now being heard in Washington. Sixteen gold mining companies alleging damages in excess of \$18,500,000 are involved. Largest claim, \$10,777,448 is presented by Homestake Mining Co.

CALIFORNIA

Kaiser Steel Corporation is building an H.M.S. plant of 400 tons hourly capacity to treat iron ores at its Eagle Mountain mine in Riverside County. 10 ft. x. 10 ft. Wemco drum separators will be used with a ferrosilicon medium.

Numerous small or medium sized deposits of chrome ore scattered throughout the state, which as a whole, are capable of some considerable production are being rehabilitated and California is experiencing something of a revival in this alloy metal. New operations are starting in San Luis Obispo and Eldorado Counties which will produce 100 tons of concentrates daily.

NEVADA

Eureka Corporation (Ventures, Ltd.) has negotiated a D.M.P.A. loan of \$750,000 which is estimated to be about one-fourth of the cost of unwatering the Fad shaft. The property is leased until 2,000 A.D. from Richmond Eureka (U.S. Smelting) which made history in the days when Eureka, Nevada, set the lead price for the country. Diamond drilling located faulted segments of veins that had been very profitable in the early days and the Fad shaft was started as a main working entry but in March, 1948, water at the rate of 10,000 g.p.m. broke into the 2,250 level. Since then there has been a continuous battle, sometimes encouraging but more often discouraging. Ventures, Ltd. has guaranteed the loan to D.M.P.A.

COLORADO AND IDAHO

American Cyanamid has entered into an agreement with the Atomic Energy Commission to build and operate a pilot plant at Grand Junction to develop new and cheaper methods for treating the ores of the locality and for handling ores that have proved refractory by present methods.

The U.S. Geological Survey has been doing some interesting work in the Coeur d'Alene district in exploration by geochemical and biochemical methods. In the former, mineral zones heretofore not known to exist were located by analysis of surface soils, and in one case reactions indicated a known ore shoot although the top was 300 ft. below the surface. Biochemical work consisted of analysing the needles and twigs of conifers. While of a limited nature it was sufficient to show the researchers that they were on the right track.

Sunshine Mining Co. is revising the flowsheet of its concentrator so as to produce a copper—high silver concentrate and a lead—iron concentrate with low silver instead of a single bulk concentrate as heretofore. This latter had the disadvantage that whether treated in a lead or copper

smelter some sacrifice in the returns on one of the minerals was involved whereas with the two separate concentrates full payment can be obtained for all contained metals.

When Consolidated Mining and Smelting Co.'s, Trail smelter was unable to operate at capacity recently because of shortage of hydro-electric power Bunker Hill and Sullivan took over some of its obligations and has been receiving shipments from Canadian Exploration, Reeves MacDonald and Giant Mascot at its Kellogg smelter. The latter is producing at the rate of 6,000 to 6,500 tons of refined lead annually.

Directors of American Smelting and Refining Co. and Federal Mining and Smelting Co. have approved a merger of the two companies on the basis of 1½ shares of American stock for one share of Federal. American has owned control of Federal for some years past.

OREGON

Harvey Machine Co. of Torrance, California, is constructing an aluminium reduction plant at The Dalles on the Columbia River. Capacity will be 54,000 tons of aluminium per year. Bauxite will be obtained from the Guianas in South America.

National Metallurgical Corporation, a new company owned jointly by American Smelting and Refining Co. and Apex Smelting Co. is constructing a pilot plant at Springfield for treatment of aluminous clays for the production of aluminium silica metal. Oregon has immense deposits of such clays, some of them highly ferruginous and research has been carried on for years in attempts to find some method of commercial treatment.

UTAH

With many of the state's leading zinc-lead mines closed down on account of the market and only one lead smelter operating Utah mine operators are inclined to take a pessimistic view of the 1953 outlook.

Merger of Silver King Coalition and Park-Utah Consolidated has been approved by the respective boards of directors. The two adjoin and are the largest properties in the Park City district although both have been closed down for some months on account of low lead-zinc prices. Gradually they have absorbed one after another of the old properties of the district and the merger will bring under one management practically all of the mines that contributed to make Park City one of the famous camps of the world. American Smelting is heavily interested in Silver King and Anaconda in Park-Utah.

United States Smelting, Refining and Mining Co. has planted about 10,000 conifers as the start of a reforestation programme in the vicinity of its Lark mine in the Bingham district. The object is to improve water supply in the nearby communities with the expectation that the trees will yield mine timbers in time.

Utah division of Kennecott Copper Corporation has practically completed driving its 7,600 ft. railroad haulage tunnel at its Bingham Canyon property. The tunnel is concreted 80 per cent of the way which brings it to the mineralized area inside of which it is to be timbered. The tunnel is driven to provide transportation directly to the bottom of the huge pit and get away from present practice in which it is necessary to haul loaded ore trains up grade until they are out of the pit before starting them on their way to the concentrators at Garfield.

Cobalt is now being produced in substantial amount at the Garfield refinery of Howe Sound Co. but full scale production will not be attained until some of the "bugs" are eliminated from this new and revolutionary method. This is the first attempt at commercial application of the Chemico process in which cobalt metal is produced directly from concentrates.

Eye Protection at the Jeffrey Mine of Canadian Johns-Manville

By I. H. SLOANE

The following article is condensed from a paper presented at the Technical Sessions, Annual Meeting of the Mines Accident Prevention Association of Ontario, in May of last year. The author is Safety Director, Canadian Johns-Manville Company Ltd., and in an introductory note he pays tribute to the safety officers and companies whose previous experiences so aided the Canadian Johns-Manville programme. Although the enforced wearing of safety goggles underground might be considered an extremely difficult task, if only from the point of view of human relationships, it nevertheless is apparent that the company in question has enjoyed a considerable measure of success both in this sphere and, as a direct result, in the prevention of eye accidents. The article, which was released by the Association last month, emphasizes the great care taken by the management in its treatment of possible psychological problems before the programme was instigated.

The protection of workmen's eyesight has long been an important phase of accident prevention work in all Johns-Manville plants. Company-wide policy lays down several basic procedures. These include annual medical examinations which are responsible for uncovering many vision defects, a subsidy of 50 per cent on all prescription safety glasses, and an unlimited budget for necessary protective equipment. The remarks which follow will concern a programme which is perhaps of more immediate interest—the universal wearing of safety glasses in the Johns-Manville underground mine.

UNIVERSAL GOGGLE PROGRAMME

In analysing the accident record for 1949, the management realized that eye accidents were a major cause of injury to employees in the underground mine. It was believed that of all accidents in the mine, this type was one which could and should be controlled.

When the company considered a "Universal Goggle" programme, it was decided to use one valuable suggestion of the Oliver Mining Company. Johns-Manville foremen were instructed to wear safety goggles at all times when underground, and various types of goggles were tried. After several months a survey was made of their reactions and from their experience it was decided that the universal wearing of safety glasses in the underground mine was practicable, and a six-curve acetate goggle was chosen as the type to be worn generally.

This goggle was selected for two reasons. First, because the foremen claimed that a six-curve goggle gave less disturbing reflections from lights shining from behind than does a flat lens; and second, because the acetate type was more popular with the foremen than the metal-rimmed type, and the management reasoned that they would be more acceptable to the men under a compulsory rule.

During this trial period by the foremen, particular attention was paid to the use by miners of safety goggles when hazardous conditions were present. It was found that, although men are supplied with goggles, a direct order by the foreman or safety engineer is necessary to overcome the human inertia of putting on the goggles. If the foreman is carrying out his duties in demanding the wearing of goggles in hazardous conditions, he finds himself continually making decisions on specific hazards throughout his shift. This factor adds to the worries of a conscientious foreman.

On the basis of the Johns-Manville foremen's experience and the company's own observations it was decided to institute a universal goggle programme underground. The problem was discussed with union representatives, the benefits accruing to the men's welfare from such a programme were pointed out, and the union officials promised their co-operation. One very important step in the programme was the help given by the company supplying the goggles. Their representative, a registered optician, agreed to fit all the Johns-Manville employees concerned. The company is certain that the acceptance of the rule by employees was aided by this professional service. In observing the fitting,

the safety engineers picked up techniques in this very important task. Special attention was paid to men who it was anticipated would find fault, and cases were issued with every pair of goggles.

NO EFFECT ON EYESIGHT

The programme went into effect on May 31, 1950. The foremen were instructed not to enforce discipline for the initial month while the men were becoming accustomed to the feel of the glasses. Gradually discipline was tightened, and finally the rule was strictly enforced. All visitors in the mine were required to wear safety goggles. On the advice of the foremen exceptions were made in the cases of dispatchers and hoistmen at their posts and men working in production drawpoints. With regard to discipline, two suspensions have occurred since the programme commenced.

After one year of the programme, it was decided that the acetate goggle was not strong enough for underground use and a change was made to metal-rimmed goggles with nose pads. This possibility had been considered before the programme was instituted. In 1951 the company doctor was asked if the wearing of goggles had had any effect on eyesight, and he reported that he had seen no indication of this in annual examinations. This favourable report bore out the advice of two ophthalmologists who had been consulted before the start of the programme.

The results of the programme are represented by the comparative figures shown in the table below. The hazards entailed when goggles were not worn may be illustrated by the two following examples of eye injuries sustained in the Johns-Manville workings.

Eye Accidents Statistics at the Jeffrey Underground Mine	Before Rule	After Rule	
	June 1949 - May 1950 Inclusive	June 1950 - May 1951 Inclusive	June 1951 - April 1952 Inclusive
Average number of employees	291	432	490
No. of accidents including lost time accidents . . .	382	651	579
Loss of sight in one eye . .	0	1	0
Serious eye accidents— F.B.* lodged in eye, &c.	26	7	5
Minor eye accidents— dust, irritation or no F.B. found	28	13	22
Other cases reported— cold in eyes—off the job—poor fitting burner's goggles, &c.	6	7	9
Total number of eye accidents	60	28	36

* Foreign Body

In August, 1948, a contractor's employee working at drifting work which was later taken over by Canadian Johns-Manville employees, lost the sight of an eye due to a piece of metal entering his eye from a hammered drill steel. And in July 1950, a man who had transferred from the contractor two days before and had continued on drift-

ing for the company, lost the sight of one eye when struck by a particle of steel from the drill steel his partner was pounding. The company is certain that the man was not wearing goggles, because since instituting the programme, many serious accidents have been averted.

The following examples of accident prevention illustrate the success of the Jeffrey Mine programme.

In June 1950, a slusher hoist operator was struck on the side of the goggles by the end of a broken slusher cable. His glasses were slightly scratched and the frame was noticeably twisted. He received a minor cut over the eye only, although the possible injury arising from a broken cable striking both eyes can be imagined. A further serious accident was avoided in January 1951, when a workman received a full pressure of released concrete in the face while unblocking a pumpcrete line. The area covered by his goggles was not injured, while the remainder of his face was covered with abrasions. In similar case was an accident reported in May 1951, when a slusher operator standing beside a substation changing plugs was struck in the face by the arc of a short circuit in the substation. He suffered minor burns to the face and flash burns to the eyes, but serious injury was prevented by the safety goggles he wore at the time.

A man's eye, and possibly his life, were saved by the use of safety goggles underground in June 1951. A man passing through a gangway was struck by a slug from a Ramset gun. An electrician misjudged the thickness of a steel plate, so that the charge in the gun and the projected stud passed through the plate, travelled 25 ft., and struck the man on the goggle lens. It was deflected by the lens into his cheek, where it lodged. And in similar case was the occurrence in November 1951, when an electrician was hammering a broken steel switch-box cover. A spear-

shaped piece of steel about 3 in. long broke off and struck his partner on the goggle lens. Although the projectile struck the lens with sufficient force to break it, there was no eye injury.

During the same month a foreman was standing beside a 10 ton car, when the bucket of a cement mixer broke an overhead trolley cable which fell and arced against the car. The foreman's face was showered with molten copper, but although his glasses were burned in many places, his eyes were not harmed.

THE FINAL CONCLUSIONS

These examples constitute the most obvious accidents where serious injury to the eyes was prevented by the wearing of safety goggles. The number of unreported cases of saved eyes is open to conjecture, but the realization is paramount that a second chance to correct unsafe practices was afforded the management. During the course of these investigations, it was discovered that many eye accidents may occur under conditions where eye protection is not normally demanded.

The experience gained at Canadian Johns-Manville since the eye protection programme was begun two years ago, has left the company's safety engineers with several very definite conclusions.

These are, first, that a majority of workmen will not of their own accord use personal protective equipment; second, that a universal goggle programme can be enforced in an underground mine; third, that to enforce the wearing of goggles employees must be fitted properly; fourth, that union co-operation is possible and essential; fifth, that exceptions to a general rule can be made without losing respect for the rule; and sixth, that if a universal goggle rule is not enforced serious eye injury can be anticipated.

Improving Coal Production

The article which follows comprises extracts from the Cadman Memorial lecture given last month by Mr. E. H. Browne, Director General of the National Coal Board, before the Royal Society of Arts. In his full and comprehensive address, the speaker stressed the necessity for a new conception of technical management and the need to develop the industry according to an overall plan. The extracts published below begin by analyzing those defects in production capacity which hamper the output of the British coal mining industry today, and conclude by identifying the cardinal factors essential to an improvement in coal production to the extent the economic situation of this country demands for a return to more prosperous times.

Whatever views may be held about central economic planning in general, there can be no doubt that for coal-mining it is essential. A National Survey and a National Plan were not only made possible by the unification of the industry: it was precisely that unification that brought to a head and made clearly apparent the need for an overall policy and plan for the development and reconstruction of the industry. That is what the National Plan is—a broad programme establishing the future production levels in the various coalfields and the rate and extent of exploration and capital development in each. This Plan had to be based on a comprehensive survey of production possibilities, which was then related to forecasts of demand. The Plan therefore is on very broad lines, and by no means immutable; it is a prerequisite for the proper development of the coal resources of the country.

THE NATIONAL PLAN

The Plan was related to an assumed demand of 230,000,000 to 250,000,000 tons per annum, and for convenience the mid-point of 240,000,000 tons per annum was used in the forward period reviewed, 1961-65. It was, however, clearly understood that this was not the maximum output available; a larger production might be produced partly by maintaining more "marginal" pits at work—pits high in cost and low in productivity—provided, of course, that sufficient manpower was available.

The Ridley Committee have recently estimated in their Report that the demand in ten years' time might be of the order of 260,000,000 tons, but they infer, that the aim should be to reduce this potential demand by improving efficiency in the use of fuel; and they make it abundantly clear that there is ample scope for this.

To aim for this larger capacity does not call for any significant change in the pattern of production of the Plan. We can see ways in which the pattern needs to be reshaped here and there. For instance, we could not see, five years ago, how to utilize the full possible expansion of production of "general" coals from the Midland fields, attractive though these were from the point of view of production cost and available resources. But in the light of a closer examination of distribution problems and an increased forecast of electricity demand, it is now possible to postulate a larger production from these areas. Another assumption, which may need to be modified, was that opencast production would have ceased by 1961-65. It is now considered that opencast may still be able to help at that time.

On the other hand it is only possible to foresee an output equivalent to the Ridley Committee's expectation of potential long-term demand under two conditions. First, that sufficient labour is available to enable us to maintain in production collieries which it had been hoped to close in the next ten years, and, secondly that the reconstruction is really speeded up.

It may, however, be open to doubt how far production ought to be pressed towards the maximum limits, because it is perhaps likely, that every increase in the output figure is likely to be accompanied by a sharp rise in the cost of production of the "marginal" tonnage.

A proportion of total output is being produced to-day at considerable loss. Thus in 1951, on inland prices 21,000,000 tons out of the total of 210,000,000 from mines operated by the N.C.B. was produced at an operating loss exceeding 10s. 0d. per ton. Ten million tons of this involved a loss of £11,250,000, or an average of 23s. 0d. per ton. Moreover, within this, 2,500,000 tons caused a loss of £4,000,000, or an average of 32s. 0d. per ton and the final 1,000,000 tons a loss of over £2,000,000—an average of 42s. 0d. per ton.

COST COMPARISON PER TON SINCE 1913

1909-1913	Cost per ton (saleable)		"Real cost" per ton* (at 1909-1913 levels)	
	s.	d.	s.	d.
Yearly Average :	7	9	7	9
1913	8	8	8	3
1922	16	8	10	3
1930	13	6	11	4
1933	13	0	17	4
1938	15	11	14	3
1948	45	7	14	1
1951	49	2	9	10
1952 (9 months) ..	56	4	11	11

* Related by the Sauerbeck Wholesale Price Index

All the indications at present are that new methods and machines will achieve success more readily in the easier conditions, where productivity is already higher than the average. Heavily faulted strata, high inclinations, and similar difficult mining conditions present considerable obstacles to mechanization; thin seams, though no doubt susceptible to new techniques of coal-getting, restrict the manoeuvring of machines and militate against the use of various types which are adaptable to thicker sections; and thin seams do not offer the concentration of production which is possible from thick seams. Roof control problems and high gas emission, which are often (though not always) associated with great depth, are impediments to increasing mechanization. Thus in general the easier the conditions the better the chance of introducing new machinery and techniques; and from this it follows that we may expect the advantage conferred by favourable physical conditions to increase rather than diminish.

MINING CONDITIONS MORE DIFFICULT

In this connection we must not close our eyes to the fact that coal is getting more difficult to mine every day. In addition—and this is important—any trend towards equalization of wages between districts will widen the disparities of cost yet further: although there are notable exceptions, the low productivity coalfields in the main tend to-day to have lower wages than the high productivity areas.

It seems likely, therefore, that the rate of increase of cost in the marginal zone will rise very rapidly indeed in the long term; and every extra ton produced will add an increasing burden to consumers as a whole.

What is the moral of all this? If my prognostications are right they show how urgent and vital is the need to minimize the consumption of coal; in the national interest capital expenditure on means to effect economy should not be related to average costs of coal production, but to a very much higher figure; and to aim for the biggest total output which is technically possible may not be as attractive a proposition in national economics as a superficial knowledge of the situation might suggest.

This is, of course, not strictly within the mining engineer's field; it is his job to produce as efficiently as he can the amount of coal the country requires. But marginal costs are very much his affair and the level of demand ought to be directly affected by these marginal costs.

Turning now to the other sense in which the "National Plan" is used, there will be no need for me to emphasize that the comprehensive physical reconstruction of the collieries is now urgent. If we are to improve coal production in the sense of producing anything like 250,000,000 tons per annum at a reasonable average cost and without an excessive volume of high cost tonnage; if indeed we are to produce that level of output at all, we must speed up the reconstruction and development of the collieries, within the framework of a National Plan designed to give the best overall exploitation of the coalfields of the country.

This formidable task of reconstruction and development remains, at the moment, a matter of anxiety. The programme has not kept up to schedule for a variety of reasons, some of which have their origin in the industry's own weakness. It is no secret that the mining industry was not geared up to planning and executing a vast reconstruction programme. Moreover, it is an inescapable fact that it has been backward in its technical organization and particularly weak in respect of planning. Another influence which has operated against progress has been the pressure for immediate production, and the conflict between this and the long-term objective.

THE COAL FACE

For a long time the industry has employed the orthodox British longwall system (adopted widely as greater depth and difficulties led to the displacement of Bord and Pillar systems) usually with coal cutting and conveying, and working on a 24-hour cycle of operations. The concept of this method has not changed over twenty or thirty years, but the proportion of output got by it with the help of machinery has risen very substantially; and so has the quality of the equipment.

The orthodox way of assisting the coal getting process by machinery is the slotting of the seam with coalcutters to provide the relief needed to make blasting safe and effective. The proportion of total output of coal cut mechanically in this way rose from about 31 per cent in 1930 to 58 per cent in 1938, and is now over 80 per cent. About 8,500 coalcutters with an aggregate horsepower of 375,000 are employed. About 10 per cent of total production is got with pneumatic picks; and there is a certain amount of soft easily won coal for which no mechanical aids are required.

The drilling of shotholes by means of electric or compressed air is now universal. Since 1938 the number of mechanical drilling machines used in coal has grown from about 3,900 to over 12,300. The differences are actually greater owing to a statistical change.

In the process of carrying the coal, shovelling into a small tub and manhandling the tub from the face to the haulage road has been very largely replaced by mechanical conveyors. A year ago nearly 200,000,000 tons were conveyed on the face and only 28,000,000 tons loaded into tubs. Over four hundred miles of conveyor has been installed on the face, and a further 1,400 miles of conveyor were in use on the roads, making about 1,800 miles in all. The proportion of coal moved in this way either on the face or in the roads increased from 53 per cent in 1938 to about 90 per cent.

INCREASED CONVEYING EQUIPMENT

This has meant a considerable increase in the amount of conveying equipment. In 1922 there were about 930 face conveyors; in 1938, 5,620; to-day nearly 10,000. The figures for roadway conveyors are not available so far back; but since 1938 they have increased from 2,200 to about 9,500. Once again, the differences are actually greater owing to a statistical change.

These processes of loosening the coal and conveying on the face have thus been very widely developed; there has not been a large scale mechanization of the intermediate process between the two, that of loading the coal on to the

conveyor, though a good deal of pioneering work has been done. Only about 5 per cent of the present output is power loaded.

The first power loading machine to replace the shovel to any substantial extent was the Meco-Moore which, after more than ten years of trial and development, came into effective use in 1944. To-day there are a hundred machines in use loading about 6,000,000 tons of coal per annum. This is as yet the only significant contribution, in terms of tonnage, to real mechanization of the coal getting process.

Despite other machines in the experimental stage, it has, however, to be admitted that the effective contribution of power loading is still very small; and so far as results to-day are concerned it is therefore necessary to judge mechanization of the coalface primarily in terms of getting and carrying the coal to the roads. The increase of mechanization within this limited field is reflected in the horsepower installed per face worker which has increased since 1943 from 1.34 to 2.05.

Moreover the improvement in the quality of equipment has been great in recent years. Since the Vesting Date about 4,100 new coal cutters, and 15,500 conveyors have been supplied to the collieries at a cost of about £20,000,000 (excluding spares and belting). Equipment in this category supplied in the year 1951 alone cost £4,000,000.

TRENDS OF OUTPUT AND PRODUCTIVITY IN COALMINING SINCE 1903

	Number employed 000's	Output 000,000 tons	Productivity		Annual Output per Man Tons
			Face Cwts. per manshift	Overall	
1903 - 1912 .. Annual Average :	936	254	Not available		271
1913	1,107	287	Not Available	19.6	259
1922	1,094	250	44.8	18.0	228
1927	998	251	50.0	20.6	251
1930	917	244	52.2	21.6	266
1933	772	207	54.7	22.4	268
1938	782	227	58.0	22.8	290
1948	724	198	58.4	22.2	273
1952	715	214	63.0	23.8	300

Now it may well be said that with the new machinery even if most of it is on orthodox lines, and with improvement in local layout at many collieries, the increase in face productivity has been disappointing, even after allowing for the fact that we are moving always to deeper, thinner and less easy seams. In fact it has risen from 52.2 cwt. in 1930, to 58 cwt. in 1938, and was about 63 cwt. in 1952.

But whether these figures are disappointing or not, it is certain that we must do better. Face productivity is fundamental to our overall efficiency. While the reconstruction of the collieries can give computable results we do not know what can be achieved in coal-face work. The field is one of imagination and initiative. The results will be profoundly important. I believe that a great deal can be done, and done immediately, under the existing conditions of the pits, and much more as a result of quite small expenditure.

TECHNICAL MANAGEMENT OF THE INDUSTRY EXTREMELY LIGHT

It is peculiarly ironic that the industry should so often be criticized for having a top-heavy force of officials; for the truth is that, especially in relation to the complexity of coalmining to-day, its technical management is extremely "light."

It is not, however, just a question of numbers: the industry needs to develop a more modern system to meet the complicated needs of the day and the future. The general pattern of organization set up by the Board has, of course,

brought about the creation of a "vertical" chain of command; this is the automatic effect of integration. But the essential structure and methods of technical management have remained much as they were. Indeed, in my view, coalmining has inherited a concept of technical control which is out of date in the twentieth century and impotent in the face of the tasks of to-day.

If we are to "improve coal production" I believe that planning work must be recognized as being of equal importance with operational management; that a new conception of technical management is needed in the industry which makes a division between the two; and that we must be ready to share the available mining engineers between these two needs.

It is not sufficient, however, to develop a composite form of technical organization broad enough and attuned to the complications of modern times: management must also have modern tools for control, for analyzing work done or to be done, and for finding means for improving efficiency.

We not only need simpler records; their content needs to be more precise. In collieries more than anywhere we need facts, not opinions. There is here an important field for the application of work study, whose techniques, designed by objective scrutiny of operations to produce measured facts, are having notable successes in other industries.

The men in the industry and relations with them still combine to form the most important single factor in our success or failure to improve production. With improved technical management, reconstruction and new methods at the coalface we shall depend in the end upon the men in the pits.

As to numbers, we shall, of course, need fewer as efficiency improves, but this does not mean that an adequate number of men in the mines is assured. Recruitment of boys over the last year has been good, but we cannot live in the stop press news; the age pattern in the industry is still unbalanced and in some coalfields there is little hope of obtaining locally the young men the pits will need. To secure them there must be careful planning of recruitment and the provision of houses in the areas where the demand is strongest or will increase. This has been recognized and the Board has its own building programme.

The vital need will persist to recruit young men and boys into the industry, and more important than numbers are human relationships.

CONCLUSIONS

I have tried in this paper to identify the cardinal factors which are needed if we are to improve coal production to the extent which the economic situation of the country will demand. They can perhaps be crystallized thus:

The industry must be developed to an overall National Plan. It must accelerate the reconstruction programme which implements the Plan, increasing the drive and resisting temptation to concentrate on immediate production at the expense of a disproportionate future loss. Simultaneously there is much to be done in immediate or in short-term improvements. The latest method and techniques for the coalface must be developed and new ones discovered, since overall productivity will inescapably be governed to a large degree by what can be done at the face. To carry out these tasks the industry must have a modern organization for its technical control, one capable of meeting the complicated needs of the age, and making it possible for individuals to carry out effectively the tasks allotted to them. Mine management must make use of the latest instruments of control which are being found effective in other industries, designed to turn a searchlight on operations and organization.

Above all, to improve coal production, management and men must pull together, in a new and corporate undertaking, where each understands the place of the other, and his own share in the partnership.

Chalk Crushing and Screening at Chinnor

A new crushing and screening plant has recently commenced operations at the chalk quarries of the Chinnor Cement and Lime Company Limited. In the article which follows, dimensional statistics and a description of operation techniques in the plant are presented. The plant is capable of handling 70 tons of dry material per hour.

In operation at the chalk quarries of the Chinnor Cement and Lime Co. Ltd., which have been worked since early in the present century, is a new crushing and screening plant designed and manufactured by the Fraser and Chalmers Engineering Works of The General Electric Co. Ltd. The plant is capable of handling 70 tons of dry material per hour containing pieces of the chalk as large as 36 in. by 24 in. by 24 in. Even larger boulders have been handled.

The chalk is excavated at the quarry face by a 1 cu. yd. mechanical shovel and loaded into 5 ton dumpers running between the face and the crushing plant on a concrete road. The chalk is tipped into a steel receiving hopper, 12 ft. long by 5 ft. wide and 7 ft. deep, from which point it is fed into the crusher by means of a moving bar grizzly feeder. This unit is particularly suitable for handling sticky material containing large pieces, and is 4 ft. wide by 15 ft. long, in its operation removing the fines ahead of the crusher which fall to the belt conveyor below. The feeder is driven by a $7\frac{1}{2}$ h.p. slipping motor having a variable speed of 480/725 h.p.m. The drive is transmitted through a vee rope drive, spur gears, and eccentrics.

Reduction is effected in a single roll crusher with a manganese steel toothed roll 30 in. diameter by 50 in. long which can be adjusted to give a product as large as minus 9 in. or as small as minus 5 in. A roll speed of 35 r.p.m. is employed and the crusher is powered by a 65 h.p. slipping motor having a speed of 725 r.p.m., the drive being transmitted by V-ropes to the crusher counter-shaft geared to the main roll. This type of crusher is very suitable for reducing somewhat sticky material, which might pack in a jaw crusher, and the model used is one of the Super Armor-frame series. The breaker plate is of cast steel construction fitted with renewable manganese steel wearing plates and a bronze hinge shaft bush. The bearing housings for

the roll shaft and counter-shaft are also of cast steel construction fitted with bronze renewable bushes. Lubrication is effected by means of a mechanical grease lubricator driven from the roll shaft.

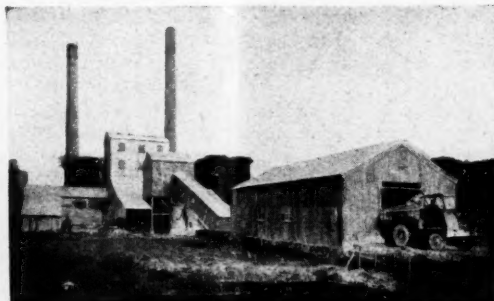
The product, together with the grizzly undersize, then passes along a 30 in. inclined belt conveyor on 156 ft.

centres, to the screening section. This conveyor is fitted with three-pulley type troughing idlers, having tapered roller bearings and mounted on steel boards, those at the feed end being of the heavy rubber-cushioned type and spaced at not more than 2 ft. centres under the single roll crusher. The return idlers are also equipped with tapered roller bearings, while the head, tail and snub pulleys are supported on roller bearings. A weighted type belt cleaner and a hold-back gear of the

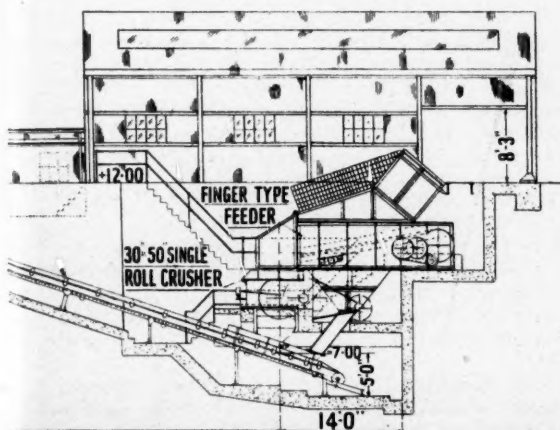
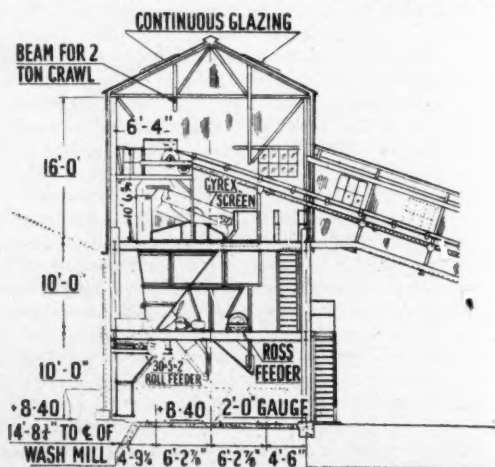
pawl and ratchet type is fitted. A 10 h.p. high torque squirrel cage motor having a speed of 720 r.p.m. drives the conveyor through a worm reduction gear coupled to the head pulley shaft.

All material is discharged from the conveyor on to a Gyrex screen, 60 in. wide by 102 in. long, style C11, from which the oversize is fed into one hopper, while the undersize passes to another. A flopper valve is provided to enable the screen to be by-passed when necessary, all the material then going direct to the undersize hopper. The Gyrex screen is fitted with a 6 in. mesh which can be varied, to suit requirements. The screen undersize passes to the adjoining wash mill of the cement plant, while the oversize is discharged by means of a chain feeder into 1 cu. yd. Decauville wagons from which it is transported to the lime kilns. The chain feeder has a width of 30 in. and is fitted with a variable speed reducing gear, driven by a 2 h.p. 720 r.p.m. motor. Frequently all the chalk is diverted to the cement plant, in which case the screening operation is omitted.

The Robins Gyrex screen employed at Chinnor is of the



The crushing and screening plant.



A diagrammatic section of the crushing and screening plant.

heavy type, having an eccentric vibration shaft of large diameter and of high grade steel, supported at its ends in heavy self-aligning double roller bearings bolted to the screen base. Heavy roller bearings are also fitted in a tubular casting rigidly fastened to side plates of the live frame so that the latter is given a circular motion of a stroke equal to twice the eccentricity of the shaft. Counterbalanced weights are provided with vernier adjustment to prevent the escape of vibration to all surrounding supporting structures. This screen is driven through a vee rope drive from a $7\frac{1}{2}$ h.p. high torque squirrel cage motor having a speed of 720 r.p.m.

The discharge to the wash mill is regulated by means of a 30 in. diameter by 62 in. wide roll feeder driven from a $2\frac{1}{2}$ h.p. slip-ring motor having a variable speed of 480/725 r.p.m., an auxiliary chute being provided so that all the material can, if required, be emptied into Decaerville wagons through a radial gate, 36 in. radius by 30 in. wide. A 5 ton

double girder hand operated travelling crane is fitted into the crusher house for servicing the crusher, feeder, and like equipments. This has a span of 24 ft. and runs on rails 25 ft. above floor level. The girders are of rolled steel section, hoisting being by worm gearing, fitted with an automatic self-sustaining arrangement and lifting the load on two parts of chain and a return block. Two hand chain wheels are provided to give two speeds to the lifting hook and similar chains are fitted for operation from the floor level. Cross traverse and long travel motions are fitted with roller bearings, the hook being mounted on ball bearings.

In addition, a travelling block worm gear is fitted in the screen house capable of lifting two tons, built into a four-wheel trolley with gear for travelling on the lower flange of a steel joist. This also is operated by chains from the floor level. Two separate buildings were erected, one for housing the receiving hopper, feeder and crusher, while the second encloses the screen, its hoppers and feeders.

Mining Activity in Indonesia

The following article, condensed from a report issued by the Information Department of the Embassy of the Republic of Indonesia in London, presents a précis of general mining activity in the Republic. It will be noted that with the exception of bauxite, output tonnages have not yet equalled those of the years immediately preceding the Second World War owing to the damage suffered by plant and equipment during the Japanese occupation.

An article in our issue of January 9, 1953, presented statistics of the tin mining industry in Indonesia, which currently maintains an output in the neighbourhood of 30,000 tons per annum, in tin content of concentrates. Production in 1940, however, stood at 41,333 tons, of which 60 per cent was won from Banka Island, and the remaining 40 per cent from the islands of Billiton and Singkop. These islands are situated off the east coast of Sumatra. Banka has its own smelting plant where a comparatively minor amount of ore is smelted, the remainder being shipped to the United States or Holland. Indeed, approximately 60 per cent of the tin ore mined in Indonesia finally reaches the United States. Output of Indonesian tin ore in 1952 showed an increase of 13 per cent over the 1951 figure of 31,000 tons.

BAUXITE AND OIL PRODUCTION

The bauxite supplied from Indonesia is found in deposits situated on the islands of Bintan and Kojang in the Rhiouw Archipelago, a group which lies opposite Singapore. Of these two sources, the island of Bintan supplies the majority of the bauxite output, while the quality of the bauxite derived from the Kojang island deposits comprises the superior grade product. A two-mile cableway connects the mines on Kojang with the sorting and washing sites on Bintan where the ore is crushed and screened. This process follows the mixing of the two ore supplies, a procedure adopted in order to reduce the total silicic acid content. This content interferes with the process which governs the satisfactory conversion of the bauxite into aluminium.

The actual mining operations are carried out as opencast workings, and are completed by utilization of modern evacuation and transportation equipment. This equipment includes the employment of bulldozers and tractors, and the industry is almost completely mechanized. All the bauxite produced in Indonesia is exported to the U.S.A. and Japan for processing into aluminium. Some 231,000 tonnes were mined in 1931. In 1951 production rose to 644,000 tonnes.

Prior to the Second World War, the main centres of oil production in Indonesia were the Djambi fields in Central Sumatra, Northern Sumatra and Java. In 1939, crude petroleum production amounted to approximately 7,949,000 tons for the entire Indonesian area, with crude petroleum from British North Borneo being processed in the refineries at Palembang in South Sumatra. Other refineries exist at Balikpapan, East Borneo, and at Wonokromo in East Java. Yet Palembang remains the principal shipping port for

petroleum products, and more than 80 per cent of the overall export quota is shipped from that port. Of the remainder of exported petroleum products, some 10 per cent is shipped from Borneo, which ranks as the second shipping centre for petroleum products.

Production of petroleum in the Indonesian area in 1951 stood at 7,375,000 metric tons, slightly less than the 7,949,000 tonnes of 1939 and the immediate pre-war years, but in less than three years has increased by well over 60 per cent above the 1948 figure of 4,327,000 tonnes. After adequate surveys had been conducted in Central Sumatra, production was recommended in the oilfields. In East Sumatra, however, reconstruction of the existing fields has not been undertaken pending a decision as to whether or not the fields are to be returned to the previous owners. Considerable importance attaches to the oil industry in Indonesia, as over 38,000 persons work at oil production.

In 1951, as in the preceding year, internal consumption of oil products again exceeded that of previous years. Indonesian civil consumption alone increased by 15 per cent and consumption for military purposes by 8 per cent, while in addition imports of petroleum and petroleum products have shown a sharp increase over the figures of the pre-war years. This influence is largely owing to great demands for high-octane aircraft spirit which cannot be produced locally until the refineries are rehabilitated. The future is regarded optimistically, however, as the only large scale refinery of this type in the area, the Palembang installation, is working once more and there is every indication that the crude oil of Borneo is well suited for the manufacture of other products.

COAL AND OTHER RESOURCES

Coal is worked at the Ombilin mines in Central Sumatra, the Bukit Asam mines in South Sumatra, and along the Mahakan river in South East Borneo. Production has not yet reached pre-war levels (2,009,000 tonnes in 1940), largely because the Ombilin mines have suffered heavy damage and produce only 50,000 tons per annum, about 10 per cent of their pre-war output. On the other hand, the Bukit Asam mines have already achieved their pre-war quota with a production of 500,000 tons per annum. The mines in South East Borneo are currently estimated to produce between 50 and 60 per cent of their pre-war capacity. Coal has been imported into Indonesia since the war, and domestic output in 1951 reached 862,000 tonnes.

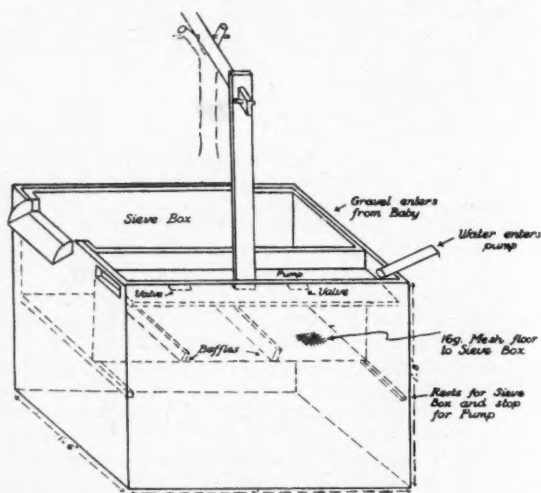
MACHINERY AND EQUIPMENT

A Hand Operated Jig

In British Guiana a simple hand-operated jig is widely used in the Potaro diamond field. It is operated in connection with a sluice, trommel and "baby" and is ideal for working large quantities of backsand. It is considered that the adoption of this unit in other fields would materially aid the exploitation of large deposits, as the jig possesses the advantage of an easy construction and will operate continuously through a full day. Its one disadvantage is that a good supply of running water is necessary.

The operating principle of the jig is that water is pulsed through the gravel as it is passing through a sieve box with small baffles. This action is accomplished by means of a simple internal pump. The pulsation of the water causes the light fractions to lift and eventually to escape over the overflow. The heavy concentrate, including the diamonds, remains behind the first baffle in the sieve box.

At the conclusion of a day's washing, the concentrate is centred in a sieve and is searched. In addition, the gravel at



The Hand Mounted Jig

the bottom of the two chambers behind the first and second baffles is searched as a check. Although the lighter concentrate minerals may reach the second chamber, diamonds should not be found there. It is reported that the usual fault in operating efficiency which may cause the escape of diamonds is excessively energetic pumping.

Flameproof Circuit Breaker Distribution Panel

Successor to the Type P.A., first introduced by the Belmos Co. Ltd. in 1933, the S.B.A. 75 air break circuit breaker distribution panel is of similar physical dimensions to its predecessor, although improvements in the circuit breaker design have brought the breaking capacity of the unit in line with modern practice. The unit is rated at 200 amp. at pressure up to 650 volts A.C. It complies with B.S.S. 229/1940 in respect of flameproof enclosure and is covered by Mines Department Flameproof Certificate No. 453 for Group 1 and No. 2927 for Group 2 gases.

The unit comprises a welded steel enclosure of two compartments, the upper containing the circuit breaker and protective devices and the lower the isolating switch and busbars. The busbars have a throughgoing capacity of 400 amp., and the isolating switch is mounted in unit with them on a removable frame.

The circuit breaker is of the 3-pole air-break magnetic blow-out type, and has been tested in accordance with B.S.S. 936-1940 and A.S.T.A. Publication 7, and has a certified breaking capacity of 7.5 M.V.A. at 600 volts. Symmetrical Breaking Capacity 7.25 K.A. at 0.6 K.V., making capacity 14.5 peak

K.A. at 0.6 K.V. Unit construction and accessibility are features of the apparatus, the circuit breaker and isolating switch interiors being readily withdrawn from the case. This feature is of considerable importance in mining service.

A Rotary Blast Hole Drill

After two years of pioneering, it is reported that the Joy 58-BH Champion rotary blast drill, by the Joy Manufacturing Co. of America, has proved successful in holing several types of igneous rocks at comparative costs. The drill is self-propelled and is mounted on crawler treads. It weighs 25 lb., is electrically powered, and can travel at up to 5 m.p.h. Three hydraulic jacks serve to level the machine quickly when in the drilling position, and it is equipped with a derrick which can be raised or lowered hydraulically. A continuous blast of compressed air, instead of water, forced through the drill stem blows the cuttings away from the bit instantaneously, and out of the hole at a velocity of 3,000 ft. per min. into a cyclone dust collector.

The tri-cone roller-type bits used with the rotary drill are made by the Hughes Tool Co., America, and are an adaptation of oil well bits, specially hardened and with directional air jets to cool the bit and bit bearings. Various tooth designs are used for different types of rock, and the cones rotate against the bottom of the hole with the teeth, according to their design, taking a small bite in hard rock or chipping out larger pieces in softer rocks. According to a report in *Mining World*, results to date show that 1,000 lb. of powder can be loaded in 2 or 3 ft. of holes drilled by churn drill, compared with 100 lb. per 6 or 7 ft. of rotary-drilled hole.

Self-Contained Breathing Apparatus

An interesting pamphlet from Siebe, Gorman and Company Ltd., gives details of the manufacturers' self-contained breathing apparatus. The firm's "Salvus" type of unit was used with distinction in rescue operations carried out at Knockshinnoch in September, 1950.

The Siebe, Gorman "Proto" type of apparatus is designed in a comprehensive range to meet a wide variety of working conditions. The Mark IV unit is designed to give an air supply to the wearer for up to one or two hours at a time, and is useful for rescue work in mines. The two-hour apparatus weighs 39½ lb. fully charged, and 34½ lb. in a lightweight design. The one-hour apparatus weighs 32 lb.

The "Salvus" model is on the same regenerative principle as the "Proto" and consists of a steel container containing about 3.5 cu. ft. of oxygen when charged to a pressure of 1,800 lb. per sq. in. Other units of the firm's self-contained breathing apparatus include the "Fireox," the "Lungovox" and the "Savox."

Other interesting equipment described are the various high pressure compression pumps for charging cylinders manufactured by the company. These may be light weight and portable or of the rotary, electrically driven and static type.

Fire Proof Conveyor Belts

Mr. George W. Odey, chairman and managing director of Barrow Hepburn and Gale, in his statement to shareholders accompanying the report and accounts for the year 1952, said that the company's experiments in connection with fireproof conveyor belts for the coal mines was still proceeding. Currently, the company had many belts running in the mines under tests, the reports on which, he said, were very satisfactory to date.

The Lubrication of Oil Engines

An exceedingly well produced book under the above title has lately been received, and presents a concise survey of modern lubricating practice, including notes on the causes and remedies of operating difficulties and on the selection of lubricating oil. The book is the sixth in a series and is available from any of the divisional offices of Shell Mex and B.P. Ltd.

METALS, MINERALS AND ALLOYS

COPPER.—The situation and outlook for copper has not been clarified since last week and if anything is more confused. After deliberation the Anaconda Copper Co. announced that its selling price would be 32 c. as compared with 27½ for Kennicott and 28½ for Phelps Dodge, though the last named is reported to be pricing copper refined from scrap at 32 c. The difference in these quotations may be due in part to the amount of their output which these big producers have to deliver to their subsidiary fabricating interests. The current impression in trade circles in New York is that the price for domestic copper may eventually steady round 32 c.; however for the time being at any rate the U.S. price appears to depend on who is the seller and most business is still on the basis of price at the time of shipment. With the lifting of the requirement that manufacturers may not use more than 40 per cent of their requirements in foreign and 60 per cent in domestic copper the question of a composite price adds another difficulty to trade.

The Central Bank of Chile has decided for the present to maintain the export price for Chile copper which is 35.5 c. f.a.s. Antofagasta for electrolytic and 35.25 c. f.o.b. San Antonio, for fire refined. There is no change in the price paid to the American companies which so far remains at the old U.S. domestic price of 24½ c. However, it is felt that steps should be taken to valorize Chilean copper in foreign markets so as to avoid a fall in price which would immediately affect the country's economy. With a rise in the U.S. domestic price, which would of course enlarge output, there is apprehension that 90 per cent of the Chilean sales at present absorbed by the United States may decline, and the possibility of new markets, particularly in France, West Germany and other European countries is being closely studied. Another mission to Washington is projected this month in the hope of extracting greater benefits for Chile. Sales to the Argentine are stated to amount to about 14,000 tons a year with minor quotas to several other countries. Meanwhile, Chile is being hampered by a coal miners' strike involving some 20,000 men.

Various companies, more particularly the Consolidated Refining Smelting and Power Company and Frobisher, are competing in a race to stake claims at the head of the Portland Canal, where a huge copper and tungsten deposit is said to have been located. Most of the big United States companies are also engaged in looking for copper in British Columbia. Japanese output of electrolytic copper last year is reported 94,385 tonnes against 90,950 in 1951.

In 1952, the output of Austria's copper mines was 104,165 tonnes of ore against 84,884 tonnes in 1951. The increase of production is due to the output from the new mine at Buchberg near Bischofshofen, Salzburg (U.S. Zone) and to further development at the separating plant at Mülbach/Hochkönig, Salzburg.

LEAD.—Lead has continued to decline and was cut to 13 c. in New York on Wednesday. However, the reduction in domestic output emphasized more particularly by the closing down of furnaces at the Herculaneum smelter of the St. Joseph Lead Company, and at the Monterrey refinery of the A.S. and R., is expected to tighten up supplies from the beginning of April onwards. Austrian production of lead-zinc ore last year is reported as 150,310 tonnes compared with 110,646 tonnes in 1951.

TIN.—Prices have shown little change this week, and generally speaking tin appears to be marking time. January production in Malaya was again high, as is usual immediately before the Chinese New Year holiday. The total was 4,998 tons compared with 4,943 tons in December and 4,743 tons a year ago. With the Chinese New Year settlement out of the way, we may be able to judge better how far current prices may be leading to a slowing down of production. So far Malayan output has been very steady over the last three years and the forecast current up till recently that it would shortly begin to show a definite decline has so far not been verified. Reports regarding the suppression of banditry are becoming more satisfactory, and unless the price of metal drops further it may be that we shall have to wait some time for the threatened pro-

duction in output to become apparent. Straits shipments in February are reported by the Straits Trading Company as 4,944 tons of which the United States took 2,231, the Continent 1,476 tons, the U.K. 375 tons with 290 tons on option, Pacific destinations 251 tons, India 150 tons, Canada 55 tons, Australasia 44 tons, Africa 42 tons, and the Middle East 29 tons.

The U.S. Department of Commerce has placed exports of tin for the first half of this year on an "open end" quota basis. Shipments of tin mill products by U.S. mills last year showed a decrease of around 9 per cent with a total of 5,062,970 tons as compared with 5,591,987 tons in 1951 and 5,314,244 tons in 1950. Last year 2,817,449 tons of electrolytic tinplate were shipped as against 1,365,590 tons of hot dipped.

ZINC.—The price of zinc on the London Metal Exchange has continued to decline and is now well below £80 a ton. The U.S. price is generally 11½ c. East St. Louis with demand slow, to which the fall in London price has contributed. French zinc smelters lowered their price to domestic consumers at the beginning of the week. Japanese production of electro zinc was 49,341 tonnes and refined zinc was 1,686 tonnes, both advances on 1951.

ALUMINIUM.—Aluminium fabricators in the United States are pressing for the complete control of the metal. U.K. output of virgin aluminium last year was 28,006 tons while imports totalled 284,169. 93,248 tons of secondary aluminium were produced containing 20,151 tons of aluminium metal. The aluminium supply to United States manufacturers in the current quarter is expected to amount to 418,000 s.tons, more than ample for all requirements.

MAGNESIUM.—The Magnesium Association claims a 60 per cent increase in U.S. production of magnesium last year with a total of 105,833 s.tons of primary metal compared with 40,801 in 1951. A big improvement in the technique for producing magnesium castings is claimed for government research carried out for the U.S. Army.

4,189 tons of magnesium and magnesium alloys were produced in the U.K. last year.

Production of magnesite in Austria last year rose to 742,259 tonnes from 644,839 tonnes in 1951. The output has increased by 86½ per cent since pre-war days.

QUICKSILVER.—The American price has been further lowered to \$200-203 per flask.

U.K. METAL & MINERAL IMPORTS—JANUARY 1953

	Units	January 1953	Dec. 1952	Jan.-Dec. 1952	Jan.-Dec. 1951
Non-ferrous metals and manufactures :					
Aluminium and alloys.....	Cwt.	153,672	324,908	4,739,905	3,545,342
Bismuth.....	Lb.	11,014	13,773	510,783	557,375
Cadmium**.....	Lb.	49,273	13,409	1,390,798	1,489,426
Cobalt and Alloys**.....	Lb.	297,604	113,794	3,362,445	3,482,535
Copper Electrolytic.....	Tons	311,191	15,174	207,311	219,166
Other.....	Tons	292,994	14,036	175,402	136,463
Lead.....	Tons	21,864	13,717	146,751	175,198
Mercury.....	Lb.	128,466	154,746	699,996	1,426,029
Nickel.....	Cwt.	10,771	13,057	133,336	112,352
Tin.....	Tons	67	69	2,870	10,859
Zinc.....	Tons	18,201	17,171	218,847	121,879
Ores and Concentrates :					
Antimony ore and conc.	Tons	Nil	210	17,831	25,745
Bauxite.....	Tons	27,584	32,962	282,265	345,647
Chromium ore.....	Tons	9,551	11,345	167,822	131,814
Iron pyrites†.....	Tons	32,732	64,353	508,004	347,688
Manganese ore.....	Tons	61,892	43,471	433,055	382,566
Molybdenum ore.....	Cwt.	6,969	2,645	65,322	62,458
Nickel ore, conc. & matte.....	Tons	2,236	2,471	33,835	34,260
Tin ore and conc.	Tons	1,598	4,727	55,130	50,616
Titanium Ilmenite.....	Tons	4,182	8,699	102,936	78,113
Other sorts.....	Tons	675	312	8,900	9,282
Tungsten ore.....	Tons	623	802	8,313	4,749
Zinc ore and conc.	Tons	35,766	11,498	193,755	180,191
Non-metallic mineral products :					
Asbestos.....	Tons	7,403	10,115	128,387	122,290
Magnesite.....	Tons	952	834	21,601	22,969
Sulphur.....	Tons	24,213	6,313	403,596	377,314

*Excluding bismuth alloys.

†Including cupreous iron pyrites.

**The figures for 1953 are not completely comparable with those for previous years.

TUNGSTEN.—The mean world buying figures in the international market are around 315s. for Wolfram, and 305s. for Scheelite, but the market continues to display a weakening tendency. A Japanese firm has concluded a supply contract for Burma wolfram by the import of 40 tons of wolfram at a price said to be 340s. per 1,000 unit. This is the last batch of the 1952 import programme making the year's total import 190 tons. The import programme for the coming year is 127 tons and it is hoped to produce a further 300 tons from the same source.

Iron and Steel

Amongst the most favourable developments in the iron and steel industry is the lighting up of the new mammoth blast furnace at Shotton. It was hoped that this would be achieved in December last but there have been unexpected delays. However, the furnace is now being nursed into full production and a further impetus will be given to the mounting figures of steel production.

That the hunger for steel is still unappeased is indicated by the continuance of the arrival of foreign material on a very heavy scale. Considerable tonnages of U.S. steel, which, but for the strike stoppage, would have been stopped last year, are still coming to hand. Imports from Belgium totalled nearly 40,000 tons in January, and the aggregate imports from all sources in the month reached the formidable total of 200,000 tons.

Assurances have been repeated that steel will be much more freely available as the year advances but there is still a wide gap between supply and demand and it scarcely seems possible that this gap can be bridged before mid-summer. Producers are unable to accept any more orders for the current period. Indeed, the general fear is that there may be substantial arrears of uncompleted contracts at the end of the month. Moreover uncertainty regarding the future level of prices is acting as a brake on new business. Firm prices cannot be quoted until the Minister of Supply reaches a decision on the application for a revision of the maximum price schedules which will take cognizance of the rise in the cost of coal. Any business done is on the basis of "the price ruling at the time of delivery." Under this arrangement the seller's position is secure but the steel user is exposed to considerable financial risk. In the interests of all concerned a quick decision is called for.

Meanwhile the makers of iron and steel have no anxiety concerning the disposal of maximum outputs. Home demand is enormous and a rise of nearly 10 per cent in the January export is eminently satisfactory. Shipments to South Africa are on a better scale, removal of some of the restrictions on the Australian trade are foreshadowed and the Canadian trade is also opening out.

The steel makers also derive some encouragement from the improvement in the supplies of scrap. A little more ferrous scrap is coming in from abroad, but the most marked advance is recorded in the mobilization of home scrap and as a result works stocks have reached the highest level for nearly two years.

The London Metal Market

The pattern of copper prices in the U.S. has not altered materially from that given in our last report, with the exception that one American producer is asking 32 c. per lb. for domestic copper. The shortage of copper in the States may continue for another 2-3 months, and as the flow of scrap is still uncertain owing to a number of holders believing that the existing price level of approximately 29 c. per lb. for high-class scrap will be increased, it would not be surprising if a general rise in the price quoted by the domestic producers takes place. In Europe the copper price remains around £270 per ton ex works.

The tin market has remained featureless, and it is difficult to foresee how the position will alter so long as the R.F.C. has to, and is willing to, supply tin at 121½ c. per lb., and merchants in various parts of the world are able to use tin as a basis for dealings in transferable sterling. The Eastern price on Thursday morning was equivalent to £957 per ton c.i.f. Europe.

The lead market has suffered a sharp decline in price, and it is not yet clear whether the new price level will bring in con-

sumers or whether a further fall is necessary. It should be remembered that the price is still several pounds above the low level touched last autumn, and there is no reason to suppose that potential demand is higher to-day than it was then.

The zinc market has also been weak, owing to lack of support and offerings of metal of Continental origin without any increase in consumer demand. It is interesting to note that on days when the price falls, turnovers have tended to increase, and it seems probable that a further decline will take place although technically the market position favours an upward swing.

Both lead and zinc prices in the States have shown a tendency to follow the London quotations as demand for both metals has been disappointing, and on Wednesday the lead quotation was lowered by 0.50 c. per lb. On the Continent of Europe both lead and zinc are on offer at quotations comparable with those established in London, and it appears that the London Metal Exchange is regaining its position as the leader in prices for these two metals.

Closing prices and turnovers for the week are given in the following table:—

	February 26		March 5	
	Buyers	Sellers	Buyers	Sellers
Tin				
Cash	£958	£960	£956	£958
Three months	£938	£939	£940	£942
Settlement		£960		£957
Week's turnover		275 tons		210 tons
Lead				
Current month	£93½	£93½	£88½	£88½
Three months	£91½	£91½	£87	£87½
Week's turnover		4,400 tons		4,125 tons
Zinc				
Current month	£80½	£80½	£77½	£77½
Three months	£80½	£80½	£77½	£78
Week's turnover		3,225 tons		5,475 tons

MARCH 5 PRICES

COPPER

Electrolytic £285 0 0 d/d

TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, £225 per ton
 10 cwt. and over £210 per ton
 Crude (70%) 20s. — 22s. nom. per unit, c.i.f.
 Ore (60% basis)

NICKEL

99.5% (home trade) £483 per ton

OTHER METALS

Aluminium, £166 per ton
 Bismuth
 (min. 5 cwt. lots) 17s. 6d. lb.
 Cadmium (Empire), 14s. 4d. lb.
 Chromium, 6s. 5d./7s. 6d. lb.
 Cobalt, 20s. lb.
 Gold, 248s. f.oz.
 Iridium, £60 oz. nom.
 Magnesium, 2s. 10½d. lb.
 Manganese Metal (96%-98%)
 £280/£295
 Osmiridium, £40 oz. nom.
 Osmium, £65/£70 oz. nom.
 Palladium, £7 15s./£8 10s. oz.
 Platinum, £27/£33 5s.
 Rhodium, £42 10s. oz.
 Ruthenium, £25 oz.
 Quicksilver, £70 10s./£71 ex-warehouse
 Selenium, 30s. 6d. nom.
 per lb.
 Silver 74d. f.oz. spot and f'd.
 Tellurium, 18s./19s. lb.

ORES, ALLOYS, ETC.

Bismuth 50% 8s. 6d. lb. c.i.f.
 40% 7s. 6d. lb. c.i.f.
 Chrome Ore—
 Rhodesian Metallurgical (lumpy) £13 2s. per ton c.i.f.
 " " (concentrates) £13 2s. per ton c.i.f.
 " " Refractory £12 14s. per ton c.i.f.
 Baluchistan Metallurgical .. £14 15s. 6d. per ton c.i.f.
 Magnesite, ground calcined .. £26 - £27 d/d
 Magnesite, Raw £10 - £11 d/d
 Molybdenite (85% basis) .. 103s. 10½d. per unit c.i.f.
 Wolfram (65%) World buying 315s.
 " " .. 352s. 6d. Selling
 " " .. World buying 305s.
 " " .. 342s. 6d. Selling
 Tungsten Metal Powder .. 30s. 8d. nom. per lb. (home)
 (for steel manufacture)
 Ferro-tungsten 25/3-25/9 nom. per lb. (home)
 Carbide, 4-cwt. lots .. £35 13s. 9d. d/d per ton
 Ferro-manganese, home .. £48 12s. 11d. per ton
 Manganese Ore U.K.
 (48% - 50%) 6s. 1d. per unit
 Brass Wire 2s. 7½d. per lb. basis
 Brass Tubes, solid drawn .. 2s. 2d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Gilt-edged were the most buoyant market during the past week. Sharp rises in price occurred and this helped the new £100m 3% Exchequer Loan 1960 which the Treasury floated at 99½. The issue was fully subscribed. Behind this cheerful tendency were better EPU and gold and dollar reserve figures for the sterling area. The country also achieved a small revenue surplus of £18.7m. This reduced the overall deficit to £327.8m. From now onwards, however, expenditure should rise rather than fall and authoritative circles expect a final deficit of around £400m. The £ remained firm abroad. The U.S.A. reported a gold outflow of 20,209 oz.

Dealings for the old account ended on Tuesday. Some of the steam was taken out of the Kaffir market by profit-taking, but by and large this was well absorbed and several sound gains were recorded, mainly in uranium shares. The prospect of the South African elections has so far had no noticeable check on the market. The Rand returns for February as usual showed lower outputs and higher working costs due to the short working month. Brakpan were down on the indifferent figures but the Goldfields group as a whole held up well. Van Dyk rose on buying from Johannesburg. East Champs D'or reached 9/9d. before profit-taking set in. Among finance houses, Consolidated Mines Selection and H.E. Proprietary were the main features; the former on the preliminary figures and maintained dividend, the latter on account of its holdings in Luipaardsvlei and New Consolidated Free State.

There was some profit-taking in the O.F.S. section, but a strong demand for the Freddie Group and Western Holding developed. No definite news can be expected for some time, but rumour has been busy anticipating good results. It is unofficially reported from the Cape that Freddie South may commence production in May. The arrangements for the liquidation of Union Free State Coal and Gold and the distribution of Harmony Shares

to shareholders has progressed further. It is expected that the share certificates will be posted to U.F.S.C. shareholders towards the end of May. St. Helena profits for February remained virtually unchanged against January, but Welkom showed a fairly sharp decline of some £4,400.

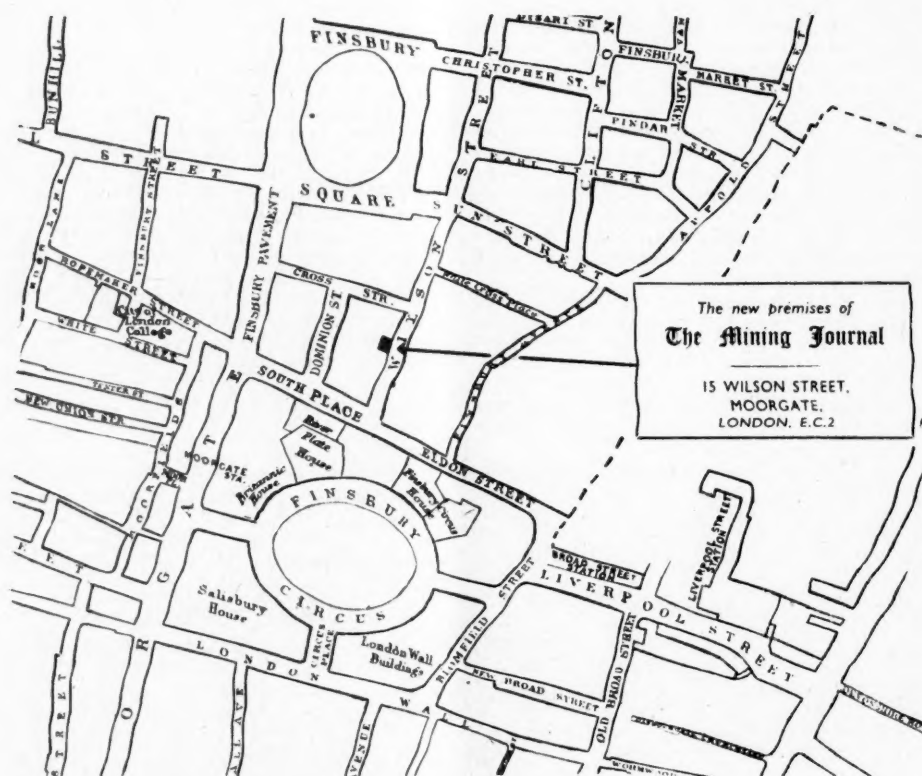
Copper shares showed all round losses on considerable bear selling. This has taken place on the doubtful metal price. Talks have taken place between interested parties in London and it is considered that a lower metal price might stop the use of substitutes by many consumers. The Yugoslav Government are reported to have offered 2,000 tons of copper to the Ministry of Materials; this was refused and it indicates the unwillingness of the Ministry to add to its already large holdings. There is clearly a good case for the resumption of free trading, and reliable opinion anticipates a considerably lower price for the metal if this were done. Market circles have calculated that a fall of even £100 per ton in the price of copper would still enable many of the companies operating in Rhodesia to show handsome profits, and the Paley report suggests that there should be no great over production problem in the foreseeable future. If the metal price started to ease, however, the share price would almost certainly follow it down some of the way, for psychological reasons alone. Exceptionally, Rhodesia Katanga rose on speculative demand.

In Eastern Tin, Ampat reached a record high level of 11/9d. Its third dredge is now in action. The price of £2,500 per ton now being paid for columbite has caused considerable activity among the Nigerian producers. Gold and Base Metals are planning increased production and Jantar, Amalgamated Tin and United Tin all showed gains in price. Beralt Tin and Wolfram eased on reports that the Ministry of Supply's tungsten stock position has resulted in the withdrawal of buying prices. The Ministry is still prepared to sell to domestic consumers at an unchanged level.

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CHANGE OF ADDRESS

Please note that *The Mining Journal* is moving offices this week-end to the new address shown on this plan:—



As from Monday March 9, our address will be

**The Mining Journal,
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Telephone : MONarch 2567 (3 lines)

Telegrams : "Tutwork, London"

COMPANY NEWS AND VIEWS

Rand and O.F.S. Returns for February

The Rand and O.F.S. mining returns for February disclose sharp declines in tonnages milled and profits obtained.

The shorter working month, together with the lower gold price of 246s. 8d. per oz. (247s. 4d. in January), no doubt played their part in bringing about the disappointing results. But it would hardly account for the exceptionally large drop in the profits of Brakpan which at £6,992 contrast oddly with the £24,614 announced in January and the £31,555 in December. Other mines to show similarly large reductions in working profit compared with January were Daggafontein, Springs, East Rand Proprietary, East Geduld, Durban Deep, Blyvoors and West Rand Consolidated.

Of the new producers only St. Helena obtained profits on a par with its January figures, West Driefontein, Stilfontein and Welkom all showing modest profit contractions.

Generally speaking, operating companies in the "Johnnies" group made the most consistent showing. For with the exception of East Champ d'Or, whose profit dropped by approximately £2,000 to £3,000 the profit of the remaining four companies in the group remained virtually unchanged.

Dalny Mine Raises Profits of Falcon Mines

On June 3, 1952, the permanent reduction plant having a nominal capacity of 12,000 tons per month was started up at the Dalny Mine. On the same date the small 100 tons per day pilot plant, which had been in operation since December 1950, was shut down.

While Dalny's full earning potential will not be realized for some months to come, its beneficial effect on Falcon Mine's financial position was apparent even after only four months operations during the year ended September 30, 1952.

Year to Sept. 30	Mining Profit £	Gross Revenue £	Expenses £	Net Profit £	To Reserves £	Carry Forward £
1952	70,030	75,691	8,781	66,910	120,000	10,066
1951	51,565	58,347	8,210	50,137	50,000	63,374

The improved results for the year ended September 30, 1952, are, of course, only a foretaste of what Falcon Mines' shareholders may expect when the company has all the factors of production under its own control. The situation at present is that—apart from the usual mechanical troubles encountered during a running-in period—Dalny's reduction plant was started up without a roaster and without the necessary plant to treat flotation tailings. However, in November last, the plant for treating flotation tailings was brought into commission resulting in an improvement in gold recovery, though gold absorption was still taking place. But the roasting unit, which is on order, has yet to be delivered and in the interim period the company are sending the maximum permitted amount to the government roaster at Que Que and stockpiling the remainder.

The summary of Dalny's operating results for the past two years summarized in the table below, clearly demonstrates the advantages accruing to the company of having its permanent reduction plant in operation.

Year to Sept. 30	Milled (tons)	Per ton milled Grade Yield (oz.)	Cost* s. d.	Expenses £	Ore Reserves Tons Grade
1952	62,300†	2.5	7,950	29 0	139,147 536 4.0
1951	28,070‡	3.11	4,365	34 3	243,000 483 4.2

* Including development charges: 1952—4s. 11d.; 1951—5s. 2d.

† Capital expenditure 1949-50 was £139,280.

‡ Including 4 months operation of main reduction plant.

§ 10 months operation with pilot plant.

As shareholders have been told time and again, all available profits have been pledged to financing the cost of bringing the Dalny Mine into production, and the above figures clearly bring out where and to what good effect the ploughed back profits have been employed. More than that the table also shows that at the full crushing capacity of 144,000 tons per annum ore reserves are sufficient for 3½ years and that currently, profits are being obtained from ore well below the grade of the ore reserves.

In addition to Dalny, Falcon Mines has two other useful sources of revenue from its two regular producers Sunace and Bay Horse, both of which gave satisfactory results during the year ended September 30, 1952. Sunace crushed 27,100 tons (25,800 tons), the grade of ore also being higher at 6.2 dwt. against 5.5 dwt. yielding a working profit of £45,813 compared with £37,719. Bay Horse sent 9,600 tons (8,860 tons) to the mill the grade being slightly lower at 4.4 dwt. compared with 4.7 dwt. in the preceding year, giving a working profit of £7,220 against £7,329. The ore reserve position at both mines is fairly good, supplies being sufficient at Sunace for nearly two years and over three years at Bay Horse at present crushing rates.

The outlook for Falcon Mines during the current year is distinctly bright. Revenue from premium gold sales will be available for the full year instead as from only five months as was the case during the year under review, which amounted to £12,335. Dalny will be in full production. The roaster unit is expected to be in commission some time this year, and the milling rate at both Sunace and Bay Horse is to be stepped up.

Monthly production returns for January and February show that Dalny attained its crushing capacity of 12,000 tons in both months and lowered working costs to 27s. per ton.

Company	February, 1953			Current Financial Year			Last Financial Year		
	Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)
Gold Fields									
Libanon	80	16,014	40-7 J	656	131,193	334	639	120,155	294
Lupaards Vlei	98	18,380	45-6 J	808	152,428	390	789	146,555	423
Rietfontein	26	5,736	25-0 D	51	11,459	50	53	11,687	55
Robinson	94	17,390	11-3 D	191	35,378	23	221	35,007	16
Simmer J.	118	18,998	13-3 D	242	38,833	26	245	38,980	34
Sub Nigel	64	21,728	102-7 J	526	181,174	918	531	186,357	1030
Venterspost	95	22,539	58-8 J	81	189,524	488	787	172,223	498
Vlakfontein	35	12,781	68-7 D	71	26,012	140	72	26,877	153
Vogels	90	22,860	88-8 D	182	46,187	182	156	39,734	153
West Drief.	33	23,619	187-7 J	227	149,144	1131	20	5,898	4
Anglo-American*									
Brakpan	103	18,433	7-0 D	219	39,145	32	218	40,747	74
Daggafontein	208	49,301	31-5 D	436	103,214	678	451	107,887	764
E. Daggafontein	82	14,359	43-0 D	171	29,911	94	187	33,737	132
S. A. Lands	94	17,111	45-8 D	199	36,066	106	211	38,420	138
Springs Mine	140	19,470	7-2 D	292	40,463	23	314	41,495	31
Welkom	52	10,287	10-1 D	107	20,971	25	74	9,245	L 83
Western	100	20,612	76-1 D	209	43,141	162	209	44,200	199
Central Mining									
Blyvoor	92	55,492	452-4 J	823	496,949	4237	864	552,436	4977
City Deep	150	29,459	25-6 D	308	60,841	50	297	60,923	57
Consol M.R.	157	22,900	15-1 J	1423	199,336	201	1517	207,048	343
Crown	242	39,355	35-7 D	505	82,154	76	515	86,585	68
D. Roodepoort	166	28,668	68-3 D	349	59,882	153	342	59,319	153
East Rand P.	168	36,957	80-0 D	360	78,722	193	401	87,325	310
Modder B.	48	5,471	0-2 D	102	11,569	4	111	12,252	15
Modder E.	103	12,002	14-2 J	922	106,412	169	943	110,747	256
Rose Deep	66	9,914	3-0 D	141	20,685	9	163	22,785	26
Welgedacht	31	3,859	4-2 J	269	33,159	36	269	31,700	32
J.C.I.*									
East Champ	24	3,996	3-1 D	50	8,155	8	59	9,581	18
Govt. G.M.A.	225	31,065	60-1 D	480	64,328	120	439	64,766	97
New State	33	4,916	1-0 D	75	10,852	2	82	13,194	2
Randfontein	288	38,112	30-1 D	600	79,366	60	681	83,124	55
Wit Gold	54	6,579	1-0 D	114	13,548	2	118	13,776	5
Union									
East Geduld	126	37,800	277-3 D	264	79,202	585	286	85,797	677
Geduld Prop.	95	14,751	30-0 D	350	30,218	62	209	30,318	78
Grootvlei	170	36,555	213 D	355	76,322	453	373	81,112	511
Marievale	54	13,493	59-2 D	114	28,393	126	119	29,752	140
St. Helena	59	11,793	16-1 D	119	23,738	32	86	16,745	2
Van Dyk	87	14,189	5-2 D	182	29,377	11	209	30,651	24
General Mining									
S. Roodepoort	25	5,715	21-0 J	216	49,254	184	217	48,353	181
W. Rand Con.	212	29,893	91-3 D	442	62,556	201	394	61,791	227
Anglo-Transvaal*									
N. Klerksdorp	10	1,427	1-3 D	21	2,745	2	21	2,431	2
Rand Leases	156	27,178	29-0 J	1393	235,364	394	1464	245,995	649
Village M.R.	33	5,198	13-3 J	270	42,272	116	272	42,370	142
Others									
N. Kleinfontein	99	13,012	27-0 D	208	27,108	57	203	26,735	61
Spaarwater	10	2,302	L 3-7 D	21	4,683	L 6	21	4,598	L 7
Stilfontein	54	14,176	62-0 D	112	29,307	128	—	—	—
W. Nigel	16	—	7-8 J	134	—	—	61	79	—

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

† West Drief.—Production commenced last February

Swingeing Tax Burden Cuts B.S.A.'s Profits

The full report and accounts of the British South Africa Company ("Chartered") reveal the precise extent to which the company suffered from taxation liabilities during the year ended September 30, 1952.

With its fortunes closely bound up the Northern Rhodesian copperbelt companies, whose prosperity in the last two years has been unprecedented, it was patently obvious that B.S.A.'s earnings in Royalties from this source would be very good indeed. This, in fact, was the case and revenue from this source expanded from £5,500,771 to £7,066,386. Moreover, investment income advanced from £801,283 to £1,203,218 and after taking into account all other income items, gross revenue was shown to be £1,906,727 higher than in the preceding year when it amounted to £6,701,343.

While general expenses were approximately £45,000 higher at £297,797, this was easily absorbed. But the swingeing burden of taxation which the company was called upon to bear of no less than £5,932,951 (£3,978,134) nullified any advantages which might have accrued from the expansion in revenue. Of this vast amount, E.P.L. was responsible for the sum of £950,000 against nil—and that for only nine months of the year. Thus net earnings were reduced to £2,674,776 against £2,723,209.

The dividend, as previously announced, was maintained at 6s. per share which required £1,379,779 after which payment, the amount to be carried forward was £4,614,557 against £3,319,560 brought in.

The consolidated balance sheet is a picture of strength. Group assets at September 30 last, amounted to £26,710,149 compared with £23,065,953 in the preceding year. This is an increase of £3,644,196 of which £2,325,256 was accounted for by an expansion in investments from £13,419,642 to £15,744,898.

A summary of the parent company's holdings, given with the accounts, shows that holdings in mining companies other than Rhodesian went ahead from £3,467,767 to £5,003,478.

Although the company will be very much interested in the current and projected expansion of activities on the Copperbelt, when it is remembered that its mineral rights in Northern Rhodesia expire in 1986, the need to cast its bread over wider seas to offset this loss becomes apparent. This might provide a clue as to why the company increased its investments during the year in mining companies, other than Rhodesian, from £3,467,767 to £5,003,478, an increase which accounts for most of the addition to its total holdings made during the year of quoted investments. These increased from a book value of £11,470,307 to £13,245,544.

Mr. Dougal Malcom is chairman. Meeting, March 6.

Company Shorts

Gold & Base May Treble Columbite Output Under New Scheme.—An interesting and important scheme under which columbite production by Gold & Base Metal Mines of Nigeria will probably be trebled in the current year was announced in a circular issued by Gold Coast Selection Trust on behalf of itself, Gold and Base Metal Mines of Nigeria and United Tin Mines of Nigeria.

The announcement stated that Gold Coast Selection Trust having checked sampled certain scattered columbite deposits in the Liruie-n-Kano District of Northern Rhodesia, acquired these areas and options in order to secure them.

It was decided, the announcement continued, to dispose of the areas and the options to Gold & Base Metal Mines of Nigeria which will be the operating company. This company has concluded a further agreement to acquire certain of the Liruie-n-Kano areas of United Tin Mines of Nigeria.

As a result of the scheme it is hoped to raise the production of columbite and tin by Gold and Base Metal Mines of Nigeria to over 670 tons tin and over 80 tons columbite this year and to increase production to over 750 tons tin and over 150 tons columbite in 1955-56. The company produced 570 tons tin and 26 tons columbite in 1952.

A "satisfactory contract" has been made with D.M.P.A., the announcement stated, for the sale of the columbite output until the end of December, 1953.

The announcement pointed out that while methods of extraction to date, have largely been carried out with hand labour working on limited water supplies, the deposits concerned under discussion are all alluvial and will be exploited by monitors, gravel pumps, and sluicing. Accordingly, arrangements have been made for an extensive water conservation scheme.

African & European Pay 25 per cent.—African & European Investments Company in a preliminary statement have announced the recommendation of 2s. 6d. per 10s. unit or 25 per cent, the same distribution as has been made in each of the two preceding years.

Subject to final audit, net profit for the year ended December 31, 1952, after providing for taxation, was £769,344 compared with £737,531. Expenditure on mineral rights and prospecting written off absorbed £63,592 (£27,412) and amounts written off shareholdings totalled £33,000 (£167,500). The sum of £250,000 (£355,000) was allocated to general reserve.

Morning Star Strikes High Grade Ore Zone.—Morning Star (G.M.A.) has announced that whilst stoping on level 19, Stirling Floor, a zone of unusually high grade ore was encountered. This high grade ore shoot was previously reported in a wining operation from level 17 and samplings of development openings indicate that the high grade shoot exists between levels 17 and 19 which will raise the grade of ore mined for some time. The effect of this rich strike is reflected in the monthly production return for the four weeks ended February 24 when 1,584 tons treated yielded 2,191 f.o.z. gold.

PETALING TIN, LTD.

MR. J. T. CHAPPEL'S STATEMENT

The twenty-seventh annual general meeting of Petaling Tin, Ltd., was held on 4th March, 1953, in Ipoh, Mr. J. T. Chappel, C.B.E., M.I.M.M., the Chairman, presiding.

The following are extracts from the Statement of the Chairman circulated to shareholders with the Report and Accounts for the year ended 31st October, 1952:—

The Company had another successful year and earned a nett profit of \$3,594,463 (£419,354); Interim dividends of 95 per cent were declared and a final of 10 per cent is proposed; an appropriation of \$500,000 (£58,333) has been made to General Reserve and a somewhat reduced balance of \$786,479 (£91,756) is left to be carried forward.

All the material required in connection with the transfer of the No. 5 dredge to Seaport Estate is not now expected to be delivered until towards the end of 1953, and it will be noted from the General Managers' report that the rate of production should be maintained so long as this unit and the No. 6 dredge are operating in the Puchong Area.

The main wired-in residential area now constitutes a self-contained village with modern amenities, and is an important factor in the maintenance of a contented and healthy labour force. Bonuses have again been paid to both European and Asian Staff and labour, and I am sure shareholders will wish to join with me in paying tribute to their continued loyal services under difficult conditions.

SECURITY POSITION

Under the inspiring and energetic leadership of the High Commissioner there has been a marked improvement in the general security position in the Federation. Tribute is also due to the Security Forces, whose improved training and experience, together with greater co-operation between the people and the authorities in the supply of information, has resulted in increases not only in the casualties inflicted on the Communist terrorists, but also in the number of surrenders, which is even more important. There is, however, no reason for complacency and there must be no relaxation of efforts to combat the Communist attacks, whether in violent form or the more insidious methods of infiltration amongst the people and labour forces, which must be expected so long as the Communist world powers continue their expansionist policy.

The report on its visit to Malaya by the American Goodwill Mission has at last been published, after more than a year's delay, and, as anticipated, there is nothing in it to justify the charges previously made by the Preparedness Sub-Committee of the U.S. Senate Committee on Armed Services in its reports of March, 1951 and July, 1952. On the contrary, the Mission's report contains facts refuting some of the Sub-Committee's allegations and provides no evidence supporting the other charges.

In March of last year, the Malayan Tin Bureau, sponsored and financed by the Malayan Tin Producers, was set up in Washington, D.C. The calls on its services to date give us every reason to believe that its establishment has been fully justified, and that it is achieving its object both in providing accurate information in the United States and by being in the position to refute immediately any ill-informed statements which may be made there regarding the Malayan Tin Industry.

The Chairman concluded by announcing the declaration of a first quarterly interim dividend of 20 per cent.

The Report and Accounts were adopted.



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UNITED TIN AREAS OF NIGERIA

MR. A. HEDLEY WILLIAMS'S STATEMENT

The annual general meeting of United Tin Areas of Nigeria, Ltd., was held on February 26 in London.

Mr. A. Hedley Williams, M.Inst.Pet., A.M.I.M.M., chairman of the company, presided.

The following is an extract from the statement of the Chairman which was circulated with the report and accounts:—

The gross proceeds from the sale of tin concentrates amounted to £72,462 8s. 9d., equal to £713 per ton of concentrate, which, with the net proceeds received for columbite, of £7,744 19s. 4d., gives the total revenue of £80,207 shown in the profit and loss account.

The net profit for the year ended June 30, 1952, of £20,191 compares favourably with that of the previous year. The Board recommend a final dividend of 6 per cent, less tax, making a total of 12 per cent for the year under review. After providing for the dividend and an amount of £13,816 for taxation, a balance of £10,422 remains on profit and loss account to be carried forward.

I made a special visit to the company's properties in Nigeria in October last and was impressed with the efforts being made by the local management in investigating and valuing new ground. I arranged that everything possible would be done, not only to increase current production both of tin and columbite, but also to make a special effort to build up substantial reserves of these products.

Arrangements have been made for the installation of gravel pumping plant and equipment on one of our main leases, and there is reason to hope for good results from using this plant, particularly in the production of columbite.

Production for the current year is encouraging. Output to the end of December was 73 tons tins and 7.05 tons columbite concentrates, the comparable figures for the same period last year being 59 tons tin and 4.5 tons columbite.

The tin ore reserves of 332 tons at June 30, 1952, shows an increase of 57 tons over the previous year.

Production of radio-active mineral commenced during the year and a trial lot of five tons of high-grade monazite was sold. Further investigation and operations are at present deferred in favour of the production of the more remunerative columbite ore.

The report and accounts were adopted and a resolution approving new articles of association was passed.

UNION FREE STATE COAL & GOLD MINES LIMITED

NOTICE TO SHAREHOLDERS

Following the placing of the Company in voluntary liquidation at the Extraordinary General Meeting of Shareholders held on January 14, 1953, the Liquidators as announced in the press on January 16, 1953, have decided to distribute on a pro rata basis, as a first liquidation distribution, two Harmony Gold Mining Company Limited shares for every five shares held in this Company. This will absorb 2,950,980 of the 3,092,206 Harmony Gold Mining Company Limited shares registered in the name of the Company at the date of liquidation.

For purposes of effecting the distribution the *Transfer Books and Register of Members* will be finally closed on the evening of Friday, March 20, 1953, and will not be re-opened, and the distribution will be made to Members who are registered at the close of business on that date.

The Liquidators have arranged to dispose of any fractions of Harmony Gold Mining Company Limited shares arising from such distribution at the middle market price ruling on March 20, 1953, and the net proceeds will be paid to the shareholders entitled thereto.

Unless instructions to the contrary are received the Harmony share certificates, together with the cash proceeds arising from sales of fractions, will be posted to shareholders at their registered addresses as soon as possible after the formalities required by the Companies Act, 1926, as amended, of the Union of South Africa, have been complied with—probably during the latter half of May.

The remaining assets of the Company are being disposed of as favourable opportunities arise and the net cash proceeds therefrom will be distributed to shareholders in due course.

Shareholders are therefore requested to retain their share certificates in this Company until called upon officially to surrender them and to advise us of any change in address.

Yours faithfully,

A. MOIR and Co.,

London Agents of the Liquidators.

London Office:
4 London Wall Buildings, E.C.2.
February 27, 1953.

BARROW HEPBURN & GALE

A YEAR OF GREAT ANXIETY

The Thirty-Second Ordinary General Meeting of Barrow Hepburn and Gale Limited will be held on March 20 in London.

The following is an extract from the statement by the Chairman and Managing Director, **Mr. George W. Odey, C.B.E., M.P.**, circulated with the report and accounts for the year 1952.

The past year has certainly been one of very great anxiety, but as I will endeavour to explain, your Company has gone through a period of sharp trade recession without the necessity of calling unduly upon reserves, and was, in point of fact, in a much stronger position at the end of the year than at the beginning.

I must first explain that the fall in hide and leather prices, which began in April, 1951, continued without interruption for a whole twelve months. To take the price of the best 60/69 lb. Ox at Manchester as an indication; the price in April, 1951, stood at 50d. lb. By December, 1951, it had fallen to 25d. and by April, 1952, it had reached as low as 15d. April, 1952, proved to be the low point and from then onwards there was a steady recovery in price until at the end of 1952, when we closed our books, it stood at 20d.

Your Board has always envisaged a position where a sharp decline in values might take place, and it was for this reason that we were at such pains to establish a large stock valuation reserve which it was always our intention to utilize should such a situation arise. It was, therefore, decided to maintain our interim ordinary dividend and await the results of the second half year. I am glad to be able to inform the shareholders that the results for the second half of the year have been even better than we anticipated and we have been able to end the year with a modest profit.

Turning to the Consolidated Profit and Loss Account we show a balance of trading profit for the year of £209,006 which, after the deduction of various items, including Depreciation and Directors' Remuneration, leaves a balance of net trading profit of £42,055. In view of the trading position which I have described, your Board decided to appropriate from the Stock Valuation Reserve the sum of £150,000 which, after deduction of taxation on the profits of the year and allowing for the £40,412 from the over-provision of taxation in the previous year, dividends from trade investments and the minority interests' proportion of losses, leaves us with a net balance after taxation, of £144,676.

To put the matter very briefly we have in a year of most difficult trading conditions maintained our Ordinary dividend by reducing our stock valuation reserve by £150,000 and by raising our carry forward to the extent of £46,000. On the other hand, a capital reserve of £70,000 has been created in South Africa and we have added £14,121 to the capital reserve of our parent company.

I need hardly say that we should have shown a substantial loss on the year's trading had it not been for the great assistance that we have received from the activities of our parent company at Grange Mills and at Mitcham, and from our South African subsidiary The Hodgson Extract Company (Pty.) Limited, all of which have shown excellent results. Our Grange Mills factory, which manufactures travel goods, Government equipment, and general leather goods, has been able to show an increased turnover.

Our Mitcham factory, which produces all types of transmission belting, conveyor belts of all descriptions for the coal mines and quarries, and, in addition, sponge rubber, rubber flooring and rubber moulded goods, has been able to maintain a high rate of output, except for a few months at the latter part of the year when trading conditions were temporarily difficult, and has contributed substantially to our profits. The Blackmam Leather Goods Company Limited is now firmly established in its new premises and both turnover and trading results have improved. Our largest subsidiary, Richard Hodgson and Sons Limited of Beverley, has had a difficult year, not only in its tannery department but also in its glue and gelatine trade, which has undoubtedly been influenced by the recession in the textile trade.

With regard to the future prospects it will be appreciated how difficult it is to form anything in the nature of a reliable forecast. Quite apart from the general decline in values, hides and leather prices have tended to wide fluctuations which have proved impossible to forecast and difficult to gauge. There is, particularly in the sole leather industry, the keenest competition; there has been some over-production which, at times, has tended to dislocate the market by the distress sales of parcels of leather. The position, however, has greatly improved in recent months and there are indications that if hides and leather can be maintained at approximately the present price levels we may hope to enter upon a period of greater stability.

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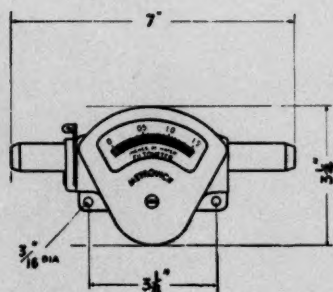
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